November 1938

TECHNOLOGY REVIEW

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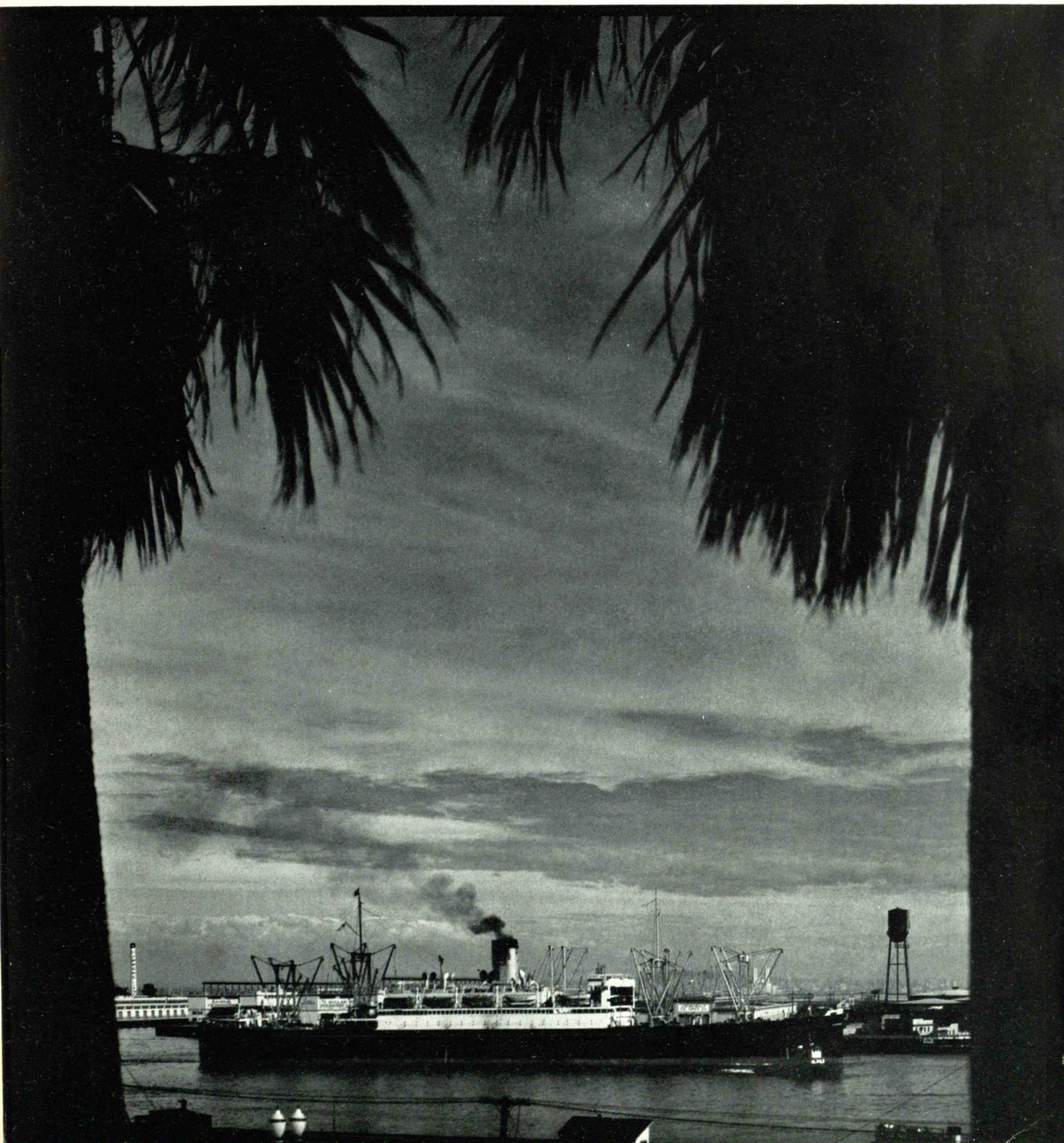

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THE TABULAR VIEW

DURING the summer months The Review has nothing to do (or so our readers, impatiently writing for copies they will never get, sometimes suppose) but to let the sun transform smudges of printer's ink into choice diacritical freckles on the proof sheets of our editorial faces. However riotously untrue this picture may be, here we are again — whether we had vacations or not — inaugurating Volume 41. In this, our initial offering, we present two welcome gentlemen with whom you are familiar and two who are new though no less welcome to these pages, respectively (but not in order of their appearance) George R. Harrison and Norbert Wiener, Milton B. Dobrin and George W. Lewis. ¶ If you want DR. HARRISON'S official title, it is director of applied physics and of the research laboratory of experimental physics at M.I.T., but the important fact about the genesis of his article (page 17) is that it is drawn from a book in preparation by him on the contributions of physics to modern life. ¶ Despite the fact that he eschews and side-steps publicity, DR. NORBERT WIENER (page 23) has been much in the public eye recently because of papers presented by him both in New York and Boston on the "calculus of chaos." (Isn't the phrase itself a brilliantly stimulating one?) We can say, we hope, without further disturbing Professor Wiener that he is one of the ablest mathematicians in America, and one of the most brilliantly articulate scholars that we know. ¶ MILTON B. DOBRIN, '36, who makes his journalistic debut in this issue (page 21), was educated both at the Institute and at Columbia University, and since 1937 he has been with the Gulf Research and Development Company in Pittsburgh. ¶ GEORGE W. LEWIS (page 24) is one of the important figures in American aeronautics, being director of aeronautical research for the National Advisory Council for Aeronautics.

FROM the report on summer changes (page 32), we saved out for separate mention here one of the most important alterations of the summer — the sea change (the new offices are green) of the two-family dwelling of The Alumni Association and The Review into something rich and, to knowing visitors, something strange. We now have a third more space, handsomely provided by the Institute, a reception room where Alumni can be pleasantly greeted and even provided with comfortable chairs (come in and let us know if we are right about this), and a rug estimated to be 20 years old.

It is all so elegant and efficient that we probably should be, as a matter of form, didactically saying that The Review in its contents and The Association in its Council meetings will respond to the new environment with a new birth of . . . but that is a sort of moralistic extrapolation that comes hard while we are still reveling in the smell of fresh paint, the prenatal noises of the new differential analyzer overhead, and the complexities of a telephone and buzzer system that seems at times to be too much even for the telephone company itself.

MAIL RETURNS

Assignment on Aerial Bombing

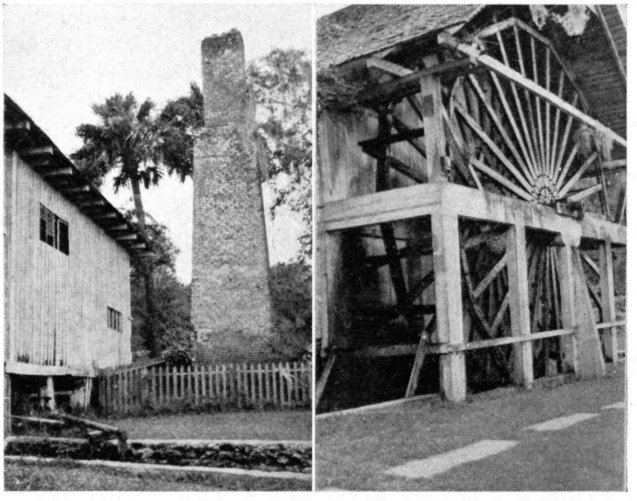
FROM WILLIAM BECKETT, '34:

Mr. Earl H. Leaf's letter describing the bombing of the Tientsin-Pukow railway in China [July Review] has revived a hot controversy among several of us on the effectiveness of aerial bombing in modern warfare. Some of us feel that the principal effect of aerial bombing is to excite the civilian population and that no real military advantage is gained thereby. We also feel that modern antiaircraft defense is very powerful and effective and that the so-called successful bombings which one reads about in the papers and in the dispatches from Spain and China are accomplished because there is no adequate defensive from the ground.

I should like to suggest with all due humility and respect that an article in The Review covering this subject thoroughly and completely in the usual fine style of all Review articles would be of great interest to Review subscribers. The Review, to which I have subscribed ever since I left the Institute, is the most stimulating and informing of all of the magazines to which I subscribe. . . .
Hamilton, Ohio

The Old Mill at Ponce de León Springs

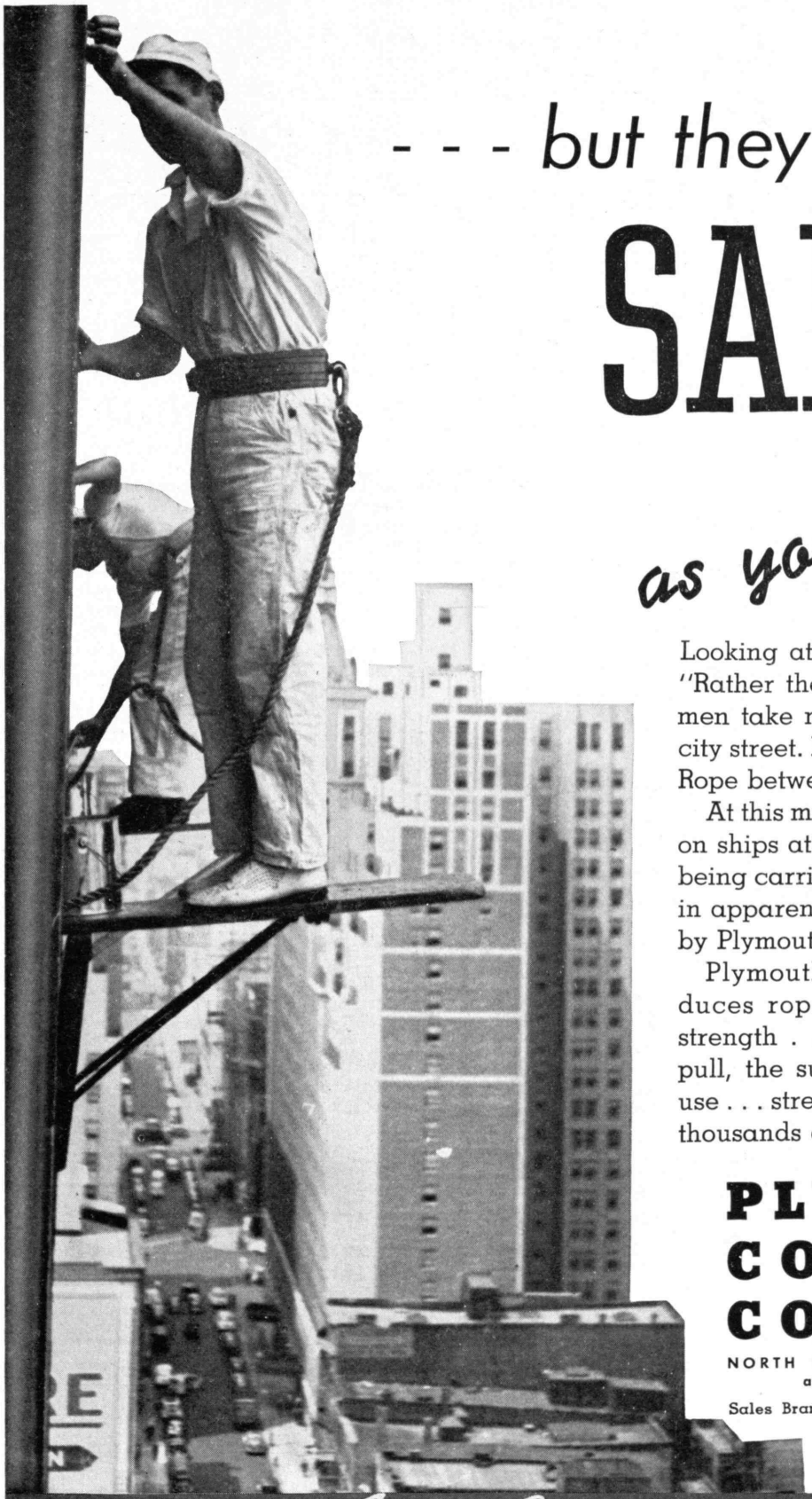
FROM M. B. CRUM, '25:



As an Alumnus and a reader of The Review, I have been quite interested in the pictures sent in by amateur photographers as published. I am inclosing . . . prints . . . which I think may perhaps be of interest to you, not so much for the quality of the photography as for the subject matter.

Some four miles north of De Land, Fla., in Volusia County, lies Ponce de León Springs. Here ended the great Spanish explorer's search for the fabulous Fountain of Youth, and here flourished a Spanish colony for more than 200 years. There is so much of adventure and romance about the old Spanish mill, a part of which still stands near the springs, that it seems as if engineers might perhaps be interested in this early engineering project. Built by the Spaniards to grind the sugar cane grown in the vicinity, it was later reconstructed by the English colonists and today undoubtedly marks one of the earliest evidences of civilization in the state of Florida.

Bits of the original machinery still lie scattered about the existing ruins, and the large chimney, itself a part of the original mill, is almost wholly intact. The bricks in this chimney are supposed to have been burned in Spain and were brought inland from the Florida Coast by oxcarts instead of up the St. Johns River. The Spaniards constructed an earthen dam around the spring, raising the level of the same about six feet above that of the near-by St. Johns River, into which the runoff flows. About half of the flow of this 20,000 gallons-per-minute spring is used for turning the huge (*Concluded on page 4*)



- - - but they feel as SAFE as you do now!

Looking at this picture you may think, "Rather they than I!" But these workmen take more risk in crossing a busy city street. Here they have stout Manila Rope between them and disaster.

At this moment, all over the land and on ships at sea, men and materials are being carried—held—lifted—lowered—in apparent peril *but complete safety* by Plymouth Ship Brand Manila Rope!

Plymouth's control of quality produces rope of uniform, dependable strength . . . to endure the long hard pull, the sudden strain, the friction of use . . . strength that means safety to its thousands of users.

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The Rope you can Trust

MAIL RETURNS

(Concluded from page 2)

undershot water wheel. The Spaniards thus had ample water power for the grinding of the sugar cane. And the forests furnished fuel for cooking the juice down to a thick syrup or the making of brown sugar and molasses. . . .

Vero Beach, Fla.

An American Fellow in Sweden Proposes —

FROM ERNEST E. LOCKHART, '34:

. . . Since I have lived another week in Stockholm, my first impressions and ideas have taken on, let us say, the vigor of youth and a bit, I hope, of the wisdom of old age. . . .

Here in Sweden and, from what I hear, to a greater extent throughout Europe, the layman has a vividly distorted picture of life in America, the correction of which must be one of the first steps toward peace on a sound basis. One of the first questions a young fellow, 16 years old, living in Gothenburg, asked me was about the incidence of gangsters in New York and Chicago. The impression, even in families where people should know better, is that America is built of skyscrapers in gold brick, its citizens predominantly gangsters, and that the main form of amusement is murder. How droll and yet how pitiful!

We all know how difficult it is to develop the idea of peace among an older generation whose best years were nourished by the hate aroused during the World War. It is likewise easy to imagine that an idea of peace would be developed most readily in a person who had no unpleasant memories and who had hopes that history would fail to repeat itself. I am one such person and I am only one of many in my generation. And yet only something similar to what has happened to me, only an opportunity actually to see how friendly and gracious foreigners can be, can make young people realize that the obtaining and fostering of peace is their job and is not that of politicians and war machines. Here I am working with a group of Germans whose leader in the homeland has developed the finest war machine in history, and I am living with a group of Swedes in a country in which the ambition of the leaders has been the development of international peace. At the present moment I feel that nothing could happen to change into hate my friendship and respect for these various peoples. On the other hand, how different might my feeling be had I been at war with them a few months ago! I feel that there should be more opportunities for young people like me . . . to see what is going on, on the other side of the water, to be able to correct distorted impressions and to form international friendships. I feel that the value to America in future good will to be received because of the fact that Mr. Virding [holder of a Scandinavian fellowship at M.I.T.] is now in America far exceeds the $1,600 which represents our combined stipends. Although $1,000 may mean considerable to a small organization like the American-Scandinavian Foundation, the remission of tuition by an institution like ours means relatively little in its economic status. Would I be rash in saying that the remission of tuition to 25 foreign students means relatively little in the economic status of an institution like ours? If our institute could stand it, why couldn't the hundreds of other colleges and universities throughout the United States do likewise? Why can't institutions of learning be made the centers of development of international good will to a greater extent . . . ?

Stockholm, Sweden

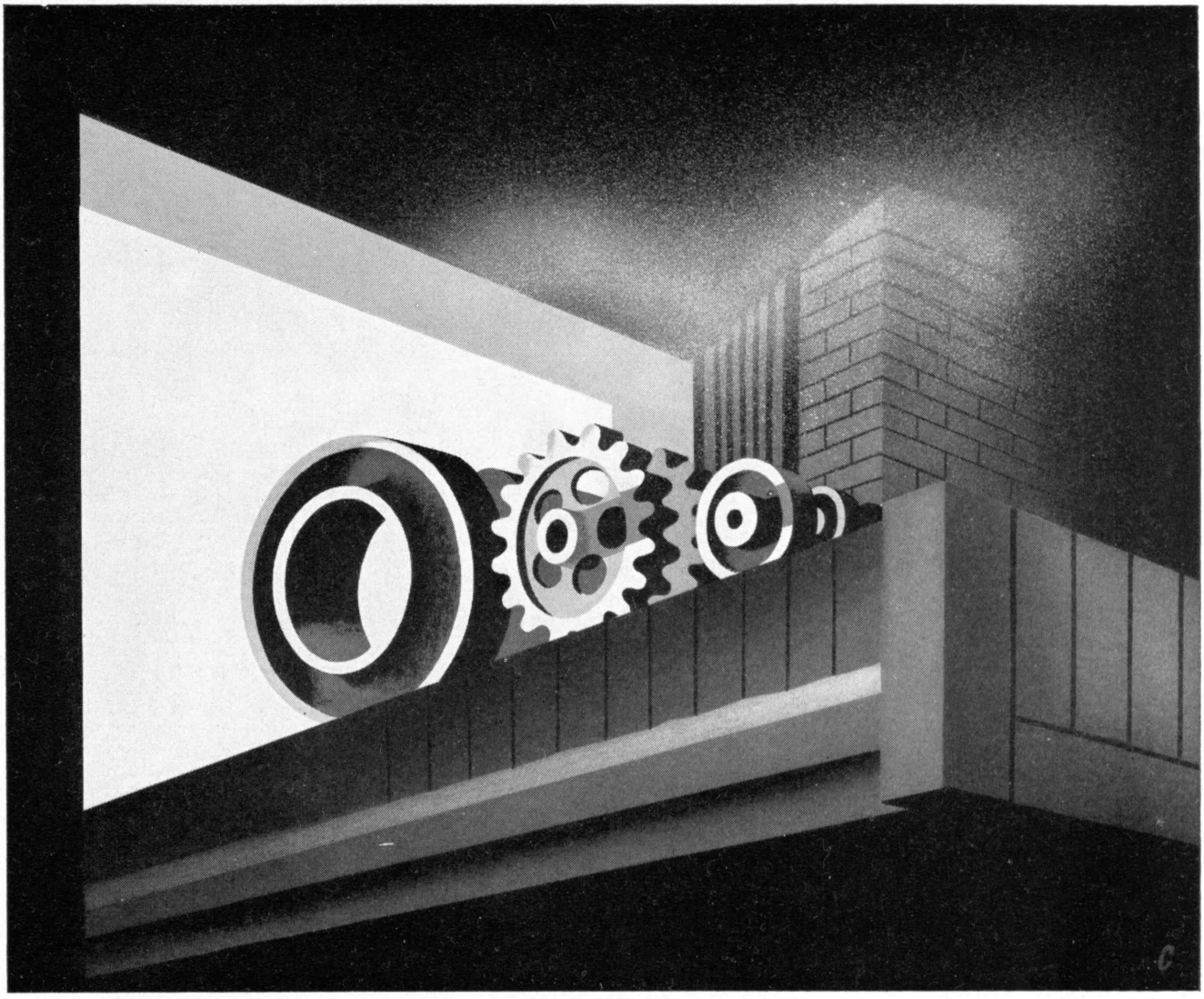
Indivisibility

FROM HOWARD M. EDMUNDS, '05:

. . . I much regretted to note in a recent issue the announcement of the death of Professor Harry W. Tyler, '84. Professor Tyler was extremely helpful to me when I first came to the Institute in 1901. He and his wife stayed at my parents' home in London, and he and I went in to King's College on each of three days when I had to take the examination for entrance to M.I.T.

As a rather striking example of Professor Tyler's sense of humor, may I be allowed to quote that on one occasion, declining an invitation because of a previous engagement, he finished his letter with the phrase "regretting my indivisibility, yours," and so on. . . .

New York, N. Y.



MINIMIZING MASS EFFECT

MANY manufacturers in different lines are profiting from the versatility of Moly steels. In one instance a single cast steel (Chrome-Manganese-Moly) is used for a variety of applications — to the benefit of both manufacturer and users.

Not only do the sizes vary, but the sections and shapes as well. The Moly steel has simplified both foundry production and heat treating problems. It also makes it easier to produce consistent results when simultaneously heat treating a miscellaneous group of castings.

Further field evidences of the practicability of "One steel — many parts" is available. And our book, ***"Molybdenum in Steel,"*** is literally based on experience, not just theory. Climax Molybdenum Company, 500 Fifth Avenue, New York.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

Climax Mo-lyb-den-um Company

MOLY

THE "ACID TEST" OF BELTING
—*and the* G.T.M.

THE compressor drives in the Vinegar Hill Zinc Company's smelter at Cuba City, Wisconsin, might well be called an "acid test" of belting. Acid fumes from the smelting process caused even top quality "double" belts to crack and separate. The maximum belt life was four years.

That is—it was until December 17, 1930, when a Goodyear COMPASS "40" truly endless belt was installed on No. 1 compressor on specification of the G. T. M.—Goodyear Technical Man. Of this belt a company official recently wrote, nearly eight years after its application:

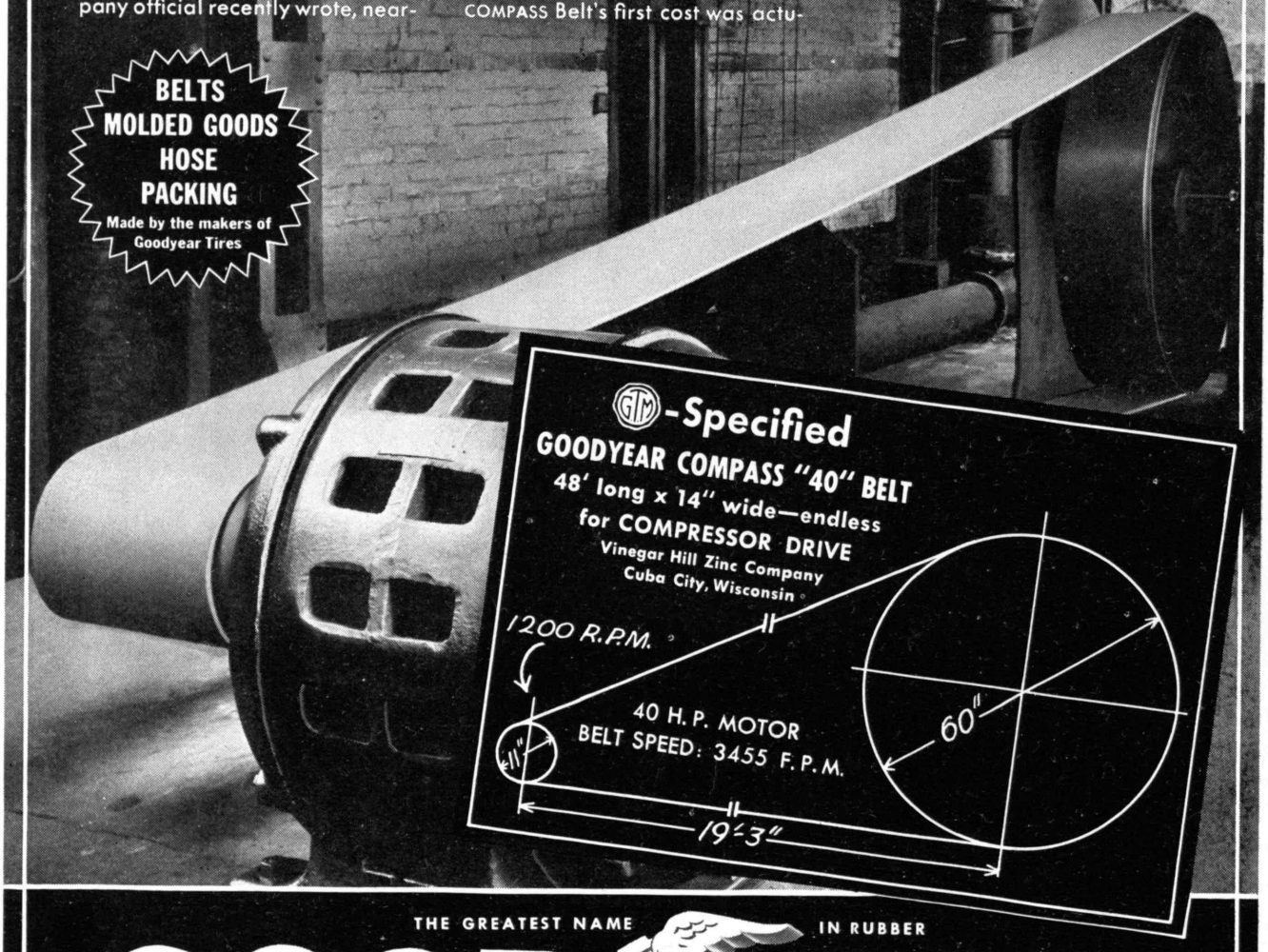
"The (Compass) belt has operated practically twenty-four hours per day, seven days per week, from the time it was installed until the present time. It has given excellent service and is still in very good condition!"

Only taken up 1"

Today the Compass belt shows only a few small cracks in the back of its envelope due to acid fumes. It has never required a single repair and only 1" take-up in all eight years. Yet despite its almost 100% greater service life, the Goodyear COMPASS Belt's first cost was actually 20% less than the "double" belt it replaced!

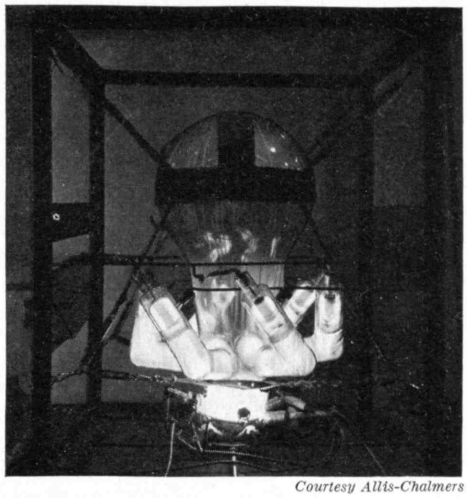
Such ability to give long, economical, trouble-free performance under unusual conditions is typical of all Goodyear Mechanical Rubber Goods. Why not talk over your difficult problems with the G.T.M.—to bring him to your office, write Goodyear, Akron, Ohio, or Los Angeles, Calif.—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

BELTS
MOLDED GOODS
HOSE
PACKING
Made by the makers of Goodyear Tires



THE GREATEST NAME IN RUBBER

GOODYEAR



Courtesy Allis-Chalmers

Beauty in functional engineering design is found not only in great engineering structures but in subtle and delicate instruments and apparatus. Here is a permanently evacuated and air-cooled 100-kilowatt, 600-volt glass tube rectifier unit used in changing alternating current into direct

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CONTENTS

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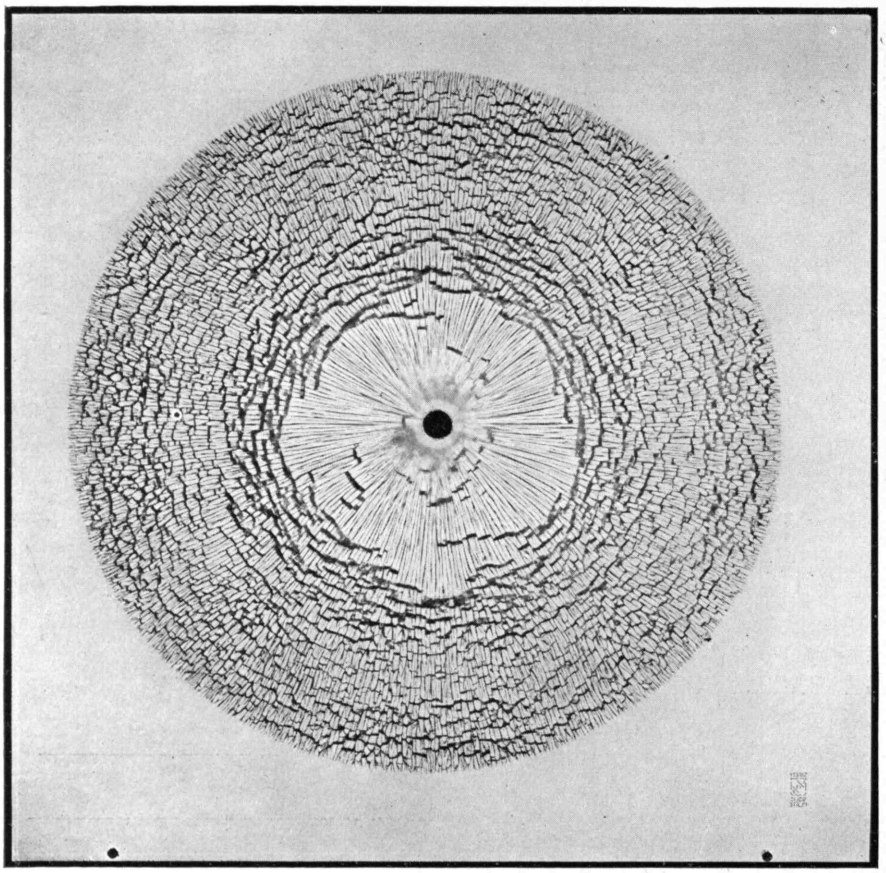
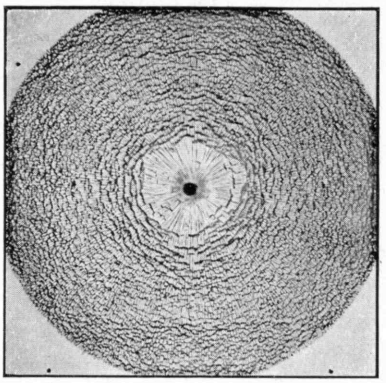
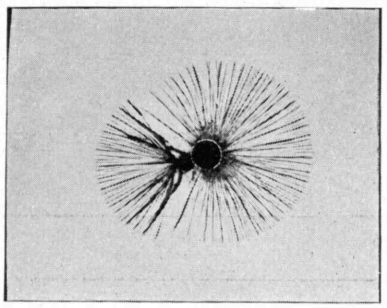
THREE WEEKS MUST BE ALLOWED TO EFFECT CHANGES OF ADDRESS. BOTH OLD AND NEW ADDRESSES SHOULD BE GIVEN.





Left and above. *Two stages in the propagation of radiating cracks from the center of a tempered glass plate. Note that the front of the cracking makes a perfect circle, that the lateral cracks seem to move inward, the radial cracks outward*



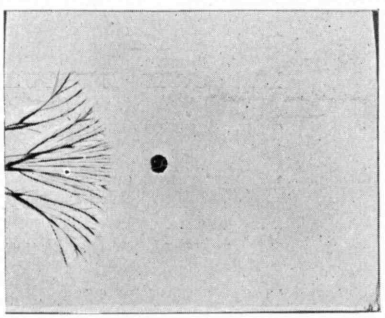
Above. *An imperfection in the glass probably causes the cracks to assume this exceptional asymmetrical formation*

HOW FAST DOES GLASS CRACK?

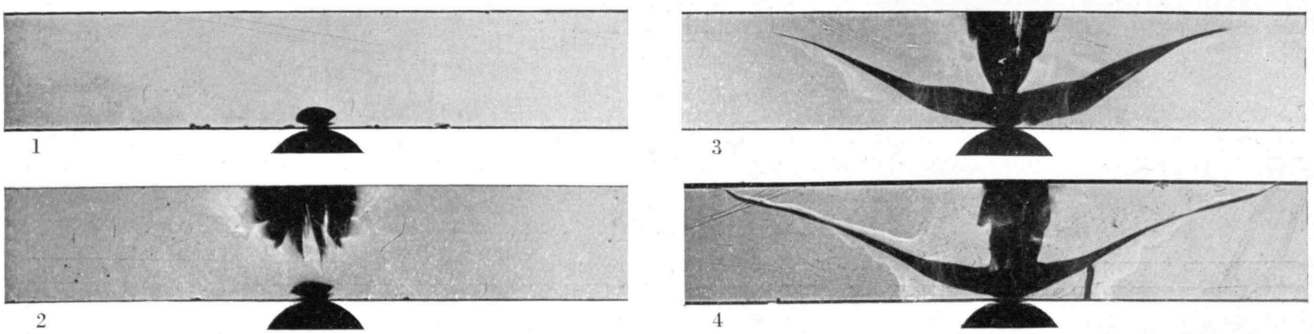
This is not an idle riddle; it is a matter of concern to makers and users of glass, for an understanding answer might aid in making a stronger bottle, a safer safety glass. It is also of interest to Review readers because of the remarkable photographs, here shown, which tell simply by double exposure not only how fast glass cracks but how it cracks.

The technique of taking these pictures is essentially this: A spring-driven metal plunger strikes the glass with enough force to break it and in doing so starts an electrical timing circuit which at the proper split-second sets off an electric flash and exposes the negative, the exposure being less than one-millionth of a second. So accurate and responsive to control is the timing that a crack moving at nearly a mile a second can be stopped dead in its tracks at any desired point — as the two pictures at the top of this page show.

This high-speed photography method of studying the propagation of glass cracks has been carried out by Graduate Student Frederick E. Barstow of M.I.T.'s Department of Physics, working under the direction of Professor Harold E. Edgerton, '27, of the Department of Electrical Engineering. The cracking speed of 5,000 feet per second obtained by the German investigator, Professor H. Schardin, using bullets has been checked by them, and their data indicate that the rate of cracking is independent of the rate of application of the breaking force and that it is the same for both plate and tempered glass.



Above. *Here the elastic wave set up by the plunger hitting the glass travels out to the edge of the plate and starts cracks forming there. The elastic wave travels 15,000 feet per second in the glass, three times as fast as the mile-a-second cracks*



Edgewise views of glass plates cracking (each view is of a different piece of glass at a different stage). The rounded top of the plunger may be seen in contact with the lower side of the plate, and above it in succession are four stages in the progress of the cracking

THE
TECHNOLOGY
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The Trend of Affairs

Push Buttons for All: A Story with a Moral

THE radio industry has recently furnished a story with a sociotechnological moral. The story is concerned with science's latest contribution to the lazy: push-button tuning. The moral is: If you design a technical improvement which is too complicated for the whole of your market, watch out! Your competitor will soon design one which is not so complicated.

Push-button radio tuning looks simple on the face of it, but the first of the current crop of push-button radios were far from simple. The reason lies in the fact that the modern radio set must be accurately tuned to the station it receives. Otherwise the fidelity of reception suffers from the malady known as "sideband cutting," in which the treble pitches are distorted and emphasized relative to the bass, as anyone can prove by purposeful mistuning. To guard against such "off-center" tuning, modern sets have for some time been equipped with "magic eyes" and similar meters which give a visual indication of correct tuning.

When automatic tuning was first proposed, the problem was taken from the operator — a benign sort of technological unemployment — and saddled on a motor-driven mechanism. The motor was coupled directly to the tuning control and caused to come to rest at the desired point on the dial by one of several segments in a switch contact which rotated with the motor. Each of the segments was adjusted to a desirable station, and thereafter the motor did the rest. This was fine except for the habit — copiously displayed by even the better sets — of drifting off calibration under the effects of heat and humidity, effects with which the motor control stolidly refused to deal. A station which comes in at 660 on the dial on hot, dry days might come in at 662 on cold, wet days. Of this change the automatic tuning mechanism could take no active account, so the station at 660 sounded awful when the weather was good and vice versa.

The tuning meter was still available to indicate mistuning, so an ingenious coupling of this meter's current to a frequency-changing circuit was devised. This is the automatic frequency control so proudly announced early in 1937, which now is viewed as a typical example of Robin Hood's barn gone around by way of Sherwood Forest. The automatic frequency control was a servo-mechanism which delighted the eye of the connoisseur of servo-mechanisms, but otherwise it was an expense. An extra tube, useless otherwise, was needed to perform the frequency adjusting, and a lot of careful designing and testing were required to make it work. So this type of push-button tuning was confined to the sets retailing at 150 dollars or more.

In its first year, push-button tuning sold a few high-priced sets, but it unsold a great many more low-priced ones. Buyers with less than 150 dollars in their pockets (those people, we remember, whom God loves because He makes so many of them) entered a store, having read about push-button sets, and asked to see the 25- or 50-dollar models. When told that none was available, these hopeful emptors caveated in considerable numbers and would have no set if it had no push buttons. In this way radio retailing in 1937 suffered because it neglected to provide its bread-and-butter market with an improvement of universal appeal.

Today all this is changed. The hopeful buyer finds a satisfactory control push button on every set at all prices, from less than 10 dollars up. The radio industry made its mistake only once. As soon as it realized that it "had something" in push-button tuning, it moved laboratory and factory to find a cheap version. The answer, obvious from the first, was soon found: Drift must not be compensated but eliminated.

New component parts, notably condensers, were designed with low-temperature drift materials and with sealings truly hermetic. Variable condensers, which could be sealed against moisture, were eliminated in favor of fixed-value units, and the tuning adjustment made in terms of inductance — a much less critical commodity. Then the motor drive was found too cumbersome and expensive and, in all small sets, was discarded in favor of simpler, direct-acting mechanisms in which the operator provides the motive power in the mere act of pushing the button. Finally the adjustment of the setting for each button was made so simple that anyone without tools could correct calibration drift.

Result: All sets are now sold on a push-button or your-money-back basis. The more expensive sets, deprived of this element of snob appeal, have fallen back on period-cabinet designs, unearthly reserves of volume, and the owner prestige latent in too many tubes. The little receiver, citadel of the poor man's culture, has its stations as bravely regimented as any.

L.M.S.

CENTENNIAL celebrations happen these days with tedious frequence, for the Thirties of the last century were a decade fertile for the ripening of undertakings destined to persist. Yet that festivity marking the end of a hundred years for Britain's largest railway system, the London Midland and Scottish, reveals more than sentimental reflections upon pioneer days when conveying the public and its goods by rail was an adventure perilous as well as dubious. Instead, as the London *Times* remarks of the L.M.S.'s second jubilee: "It is not unfair to say that the development and progress of English railways have been more remarkable than their discovery."

The pedigree of the L.M.S. traces back to the London and Birmingham, the promoters of which, in 1830, engaged the services of George Stephenson who was at that time in the first blush of fame as builder of the Liverpool and Manchester, upon which railway — the first definitely built to carry passengers as well as "goods and minerals" — the *Rocket* had demonstrated the practicability of the steam locomotive. Construction of the L. and B. proceeded under Stephenson's auspices during eight years, although he delegated much of the work to his son, Robert, and through service was inaugurated by a train which left London for Birmingham on September 17, 1838.

The L. and B. cannot claim to have been the earliest railway in Great Britain; for that matter, several American systems — the Baltimore and Ohio, the Delaware and Hudson, and the New York Central — have roots antedating 1838. But the L. and B. was the first

John M. Holeman, '38

DARK SUNRAYS

Here the camera has captured the interesting phenomenon of shadowlike sunrays piercing a cloud-flecked sky

W. C. West, '11

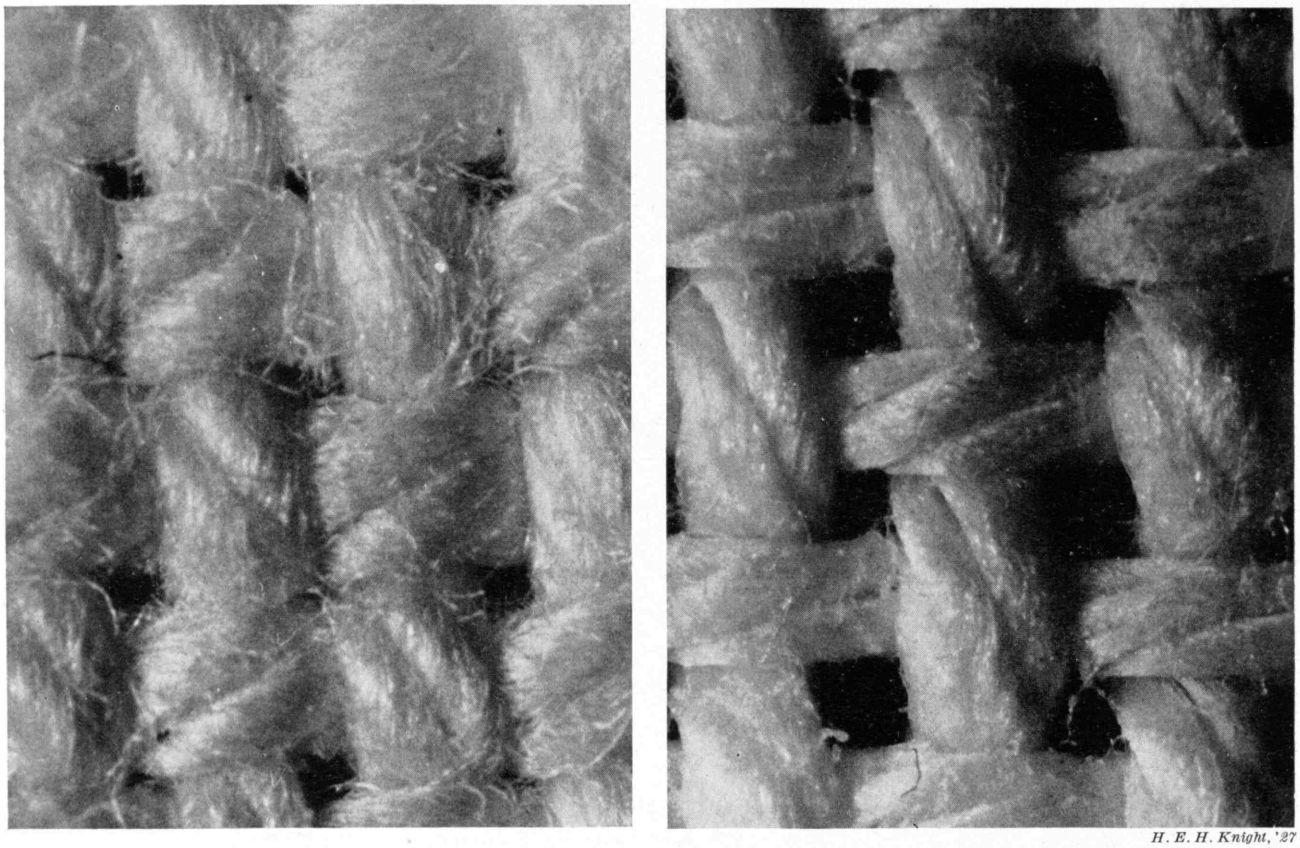
THE HEAVENS PROCLAIM

. . . and Pegasus rides the sky over Lake Michigan (do you see him?)

of appreciable length, the first to enter London, and — more important — the first to make a genuine impression upon the traveling and commercial habits of the British people. Again in the words of the *Times*, it was "a great — clinching success."

Even today the automobile is still regarded by a sizable proportion of the population of Great Britain as a luxury, but railroads, almost from their beginnings, were accepted and used by all classes. Of this reception the early management of the L. and B. happily took cognizance, and the prestige it acquired has been shrewdly maintained throughout ensuing amalgamations, the last of which — with the Midland, the Lancashire and Yorkshire, and the Caledonian, under the Railways Act of 1921 — gave birth to the London Midland and Scottish on January 1, 1923.

Hard-headed awareness of the changing wishes of all sections of the public has been amply demonstrated many times by the adeptness with which the management has often anticipated public opinion. In doing so, however, it has been seldom remiss through failure to respect that public's inherent conservatism and fondness for that which has been, as is instanced by the *Royal Scot* which leaves Euston Station, London, for Carlisle and Glasgow at 10 A.M. On the L.M.S. it is now outranked by the newer and swankier Number 1 limited, the *Coronation Scot*, but in speed, comfort, luxury, and cleanliness the *Royal Scot* today is a train in-



H. E. H. Knight, '27

AIR-CONDITIONED FABRIC

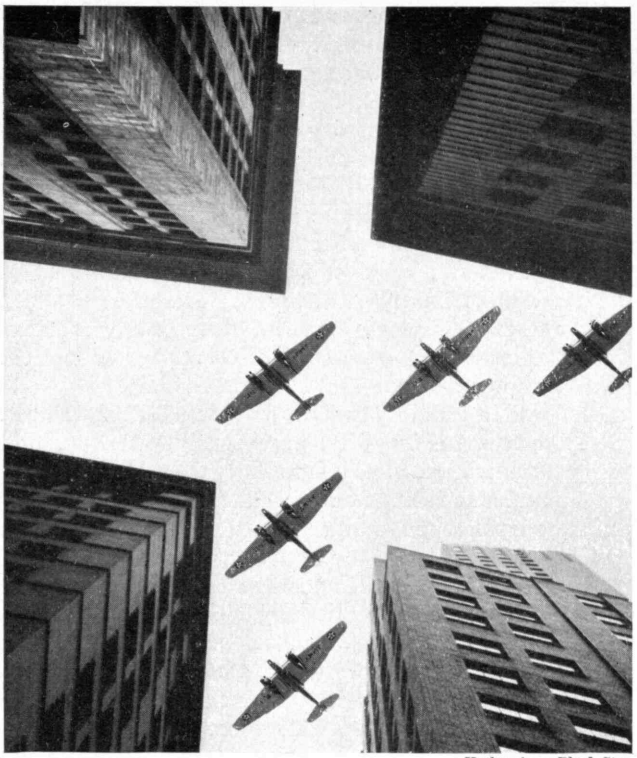
Here, magnified approximately 80 times, are two specimens of the same fabric — the left specimen with a normal finish, the right specimen after a special treatment for opening up the interstices to render the cloth more permeable by air. This air-conditioned cloth is finding increasing use for clothing because, as its sponsor iterates, it "lets the body breathe," improves the appearance of the fabric

comparably finer than its predecessors of even a few years ago. Nevertheless, the *Royal Scot* still leaves Euston for Carlisle at 10 A.M.; and the *Royal Scot* has been scheduled out of Euston for Carlisle each and every morning at ten o'clock for the past 90 years — since 1848!

Many parallels may be observed in the early histories of the L.M.S. and several important American systems. The building of the L. and B. was attended by construction mishaps, by opposition from landowners and canal operators, and many of its rights of way were acquired through curious maneuverings. Moreover, it cost considerably more than its promoters had anticipated, while, once in operation, it experienced severe financial pains through competition induced by a reckless epidemic of railroad building. It amalgamated with some of its rivals and also very early in its history it added the first of its steamship affiliates and began to set up its chain of hotels. In the newer and finer private "carriages" which it regularly provided for royalty, the evolving ideas of ultrasplendid passenger equipment may be traced, even as over here one may do so by examining woodcuts of the gaudy rolling stock built by Pullman for those who could pay the price.

British railroads, like our own, experienced governmental operation during the War, but over there post-War talk of consolidation into systems passed beyond the point of discussion. It is in the 15 years that have elapsed since the L.M.S. thus came into being that the benefits of technological research have been most apparent. The import of a reduction of the number of types of locomotives from 404 to 162 upon operating efficiency does not require explanation. Nor do safety considerations which have been stressed through roadbed improvements, welding rails and switches, perfection of signaling equipment, and by more careful training of personnel. In fact, much of its present high *esprit* is on account of a policy of having definite schools of transport and salesmanship which have enabled the L.M.S. to integrate its operations with automotive and air services more effectively than have most American contemporaries.

Electricity as a form of motive power is a 35-year-old story on the L.M.S., and it is partially the means by which faster and better local and suburban services are supplied than those to which we are accustomed. Experimentally the L.M.S. has flirted with the Diesel but in a distinctly mild way compared to what has been done on the Continent and over here. Steam still reigns supreme as prime mover for the line's long-distance limiteds, the schedules of which have been notably speeded, although not to the point — as is sometimes casually asserted — that they exceed our own. For example, the 61.7 miles per hour average of L.M.S.'s steam-propelled *Coronation Scot* on the 401-mile London-Glasgow run with one intermediate stop, compares with the 63 miles per hour average of the C.M.St.P. and P.'s steam-propelled *Hiawatha* on the 410-mile Chicago–St. Paul run with six intermediate stops. Another com-



Hatlem from Black Star

BOMBERS OVER NEW YORK

parison is also of interest: the London and North Eastern system operates its steam-driven *Coronation* at a 65.5 average on the 393-mile London-Edinburgh run, and between London and York (its single intermediate stop) the *Coronation* averages 71.9, whereas the Union Pacific's Diesel-driven *City of Denver* averages 73.6 on the 560-mile Denver-Omaha run with seven stops.

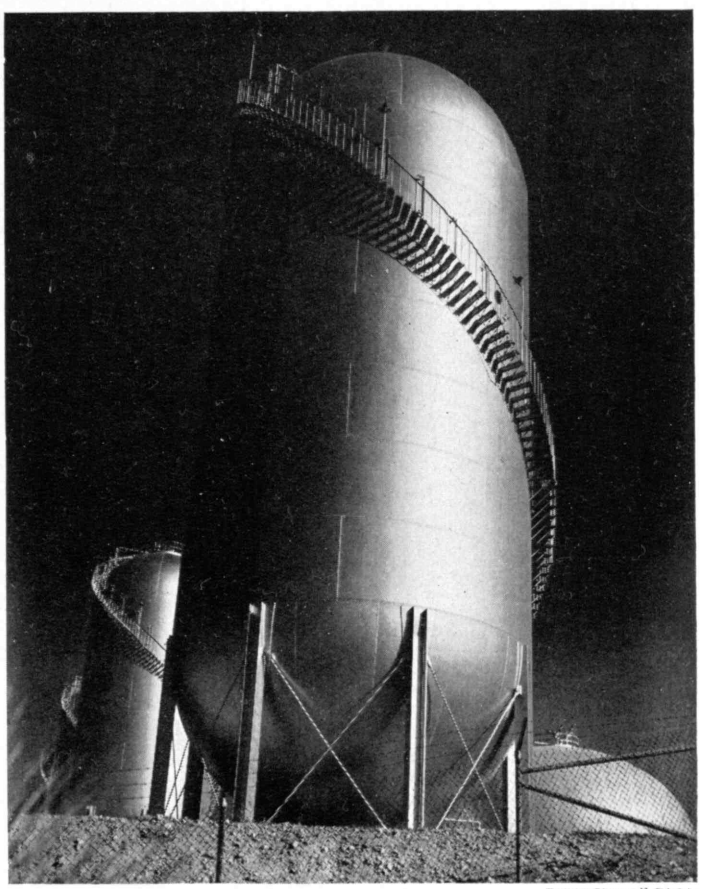
In exquisite decoration, special-train features, noise insulation, and countless other instances of consideration for the comfort of a passenger, the *Coronation Scot* and the *Coronation* are tops or near tops. The same might be said of their respective sisters, the *Royal Scot* and the *Flying Scotsman*, save for their lack of air conditioning. It seems strange that British roads, which have been so progressive in most respects, have been so timid in accepting an improvement which has met with such a universally enthusiastic reception over here. It is still more perplexing that one of the editors of the *Times* attempts to dismiss the subject by saying that the English "climate . . . does not justify the provision of air conditioning plant on such elaborate lines as in America. . . ." Maybe so, brother, maybe — but do you know that out in California even the natives are saying that it helps their climate!

Signpost

THREE HUNDRED carefully selected boys, vanguard of an expected 2,500 enrollment, began work this fall in a project in secondary education which has much significance to colleges of science and engineering. The boys were the first class to enroll in the Bronx High School of Science, latest addition to New York City's educational system. The curriculum of the new school is built upon the physical and biological sciences; its objects are to develop the scientific way of thinking and to prepare a rigidly selected group of students for entrance to college as premedical, dental, engineering, or law students. Boys who do not go on to college after four years in the High School of Science will have upon graduation the training necessary for hospital technicians, sanitation workers, food market experts, and similar workers.

Six laboratories with thorough equipment for physics and chemistry provide opportunity for the special emphasis which is laid on laboratory study during the course. Students will devote 40 per cent of their time to the sciences and, during the remaining 60 per cent spent on the humanities, will do much writing and required reading bearing on science. In addition, the use of two experimentation shops will round out the training. In one of these a furnace, a forge, a welding outfit, and other mechanical equipment will make it possible for students and teachers to build much of the apparatus needed for their laboratory work. A science library of nearly 2,000 volumes already is available at the school.

The teaching staff this fall includes 25 carefully selected members, whose ranks will be increased to about 100 to keep pace with the annual entering classes of 600 students who will be admitted until enrollment reaches the desired figure of 2,500.



Robert Yarnall Richie

PETROLEUM TANKS IN TEXAS

Though the scientific motif will be followed to a degree in humanistic studies in the new school, the fact that three-fifths of the student's time is devoted to the humanities is insurance against lack of perspective. For secondary school boys to be properly grounded, appreciation of the social matrix into which scientific activity must fit is as important as it is to the most advanced worker in research. Inclusion of social studies in the program is wise. Emphasis upon the social and sociological implications of science and engineering will, it is to be hoped, be a clear part of their teaching.

The Moon and Buckminster Fuller

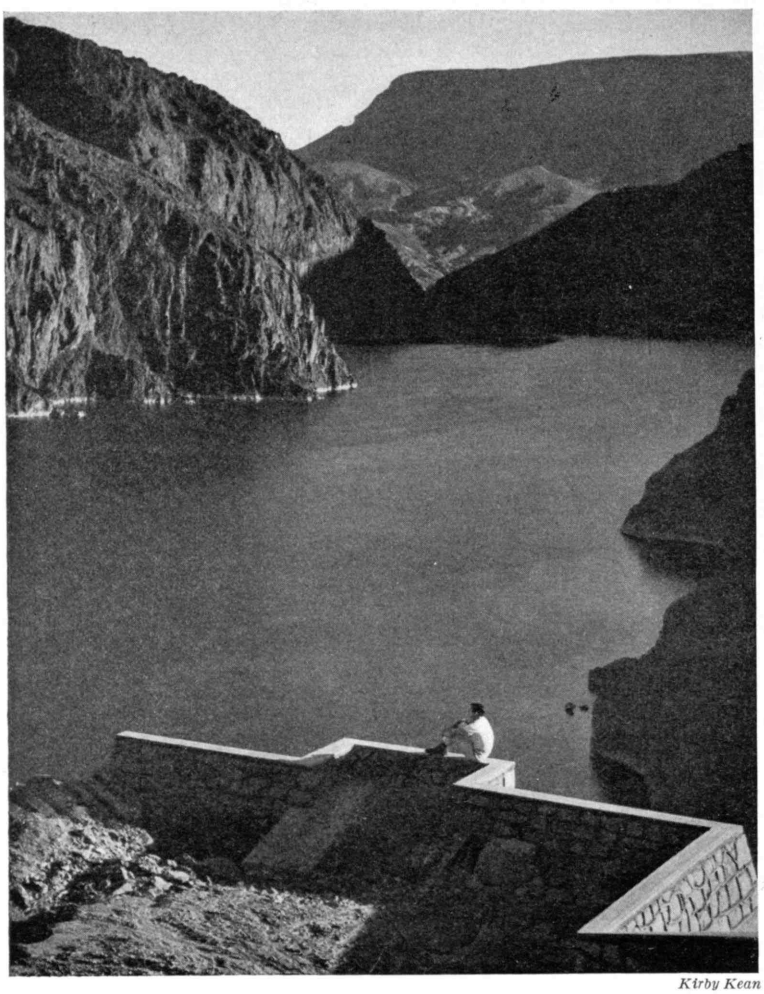
FIND yourself a brilliant, fast-thinking engineer who has read widely, who is impish, irreverent, brilliant as critic and phrasemaker, imbued with a majestic awe of science but with no sense of personal inferiority before it; marinate him in a dressing of James Joyce, Gertrude Stein, and E. E. Cummings; give him the proper setting to talk without restraint; surround him with a phalanx of the fastest stenotype operators; and let him open the floodgates of his words; you may then come out with material resembling that in "Nine Chains to the Moon." [1]

Buckminster Fuller, long known to the public as the proponent of Dymaxion this and that (notably house and car), is nevertheless a competent engineer with some excellent accomplishments behind him. He has done a great deal of thinking in producing this book, but he has not always filtered his thoughts. The result is a bewildering complex of history of science, witty and versatile criticism, technological prophecies, proposals for a new economic and social order, and one conclusion which warrants this essay. The book is provocative, clear, confusing, superficial, profound, nonsensical, sober, or trivial at every turn of the wheel of a man's scintillating mind which rotates at such a speed that one expects pieces of it to whirl at any moment into the cosmos of which the author is so enamored. The book is never dull and is worth reading.

It is worth reading, that is, if the reader can read it. Fuller can write limpidly, humorously, with wit and penetration. Most of the time he writes like a skilled craftsman. But he will not stay on the track. From what must be laziness, he insists on contriving new, awkward words, such as "brainistic," "stressively," "checkage," "perpendiculated," which accomplish nothing except to annoy the reader. Occasionally the mint produces a coin which is not dross, such as "inanislave," but in most of these cases the words are portmanteau and have required no great contriving. With most of the author's other affectations, his capitalizations and his hyphenizations, the reader will perhaps bear. At times the Latin-root words which constitute full 99 per cent of his vocabulary are compounded and recompounded until one is willing to bet that for mouth fillers the language of Fuller outstrips the language of the Führer. But it cannot honestly be said that this style of his does any more than to make the going harder; until the peroration, at any rate, a conscientious reader may feel that he is understanding, that though breathing hard he is still in the race; but any misconceptions on this score will be quickly dissipated in the home stretch where Fuller really turns on the heat.

Readers of The Review will resent other weaknesses more. It is unkind and untrue to suspect from this book that Mr. Fuller has been too long away from his confreres, too often in the society of those to whom he is The Engineer, but one can almost sense an adulation by the laity such as was accorded to Hugo. The obvious instinct of anyone placed in such an environment is to become pontifical (with full implications of infallibility as well). It is all too easy these days to invent some science when none falls readily to one's discoursing tongue. The book abounds in statements which at best must be characterized as pseudo-scientific. More frequently still, there are collections of facts which seem highly irrelevant (though it is certain Mr. Fuller could shout us down on this). Long dissertations on the difference between the nautical and the land miles, on the total volume of humanity as compared with the Empire State Building seem to lead us nowhere. The Empire State Building, by the way, is one of the favorites of

[1] New York: Lippincott, 1938. 406 pages, $4.00.



Kirby Kean

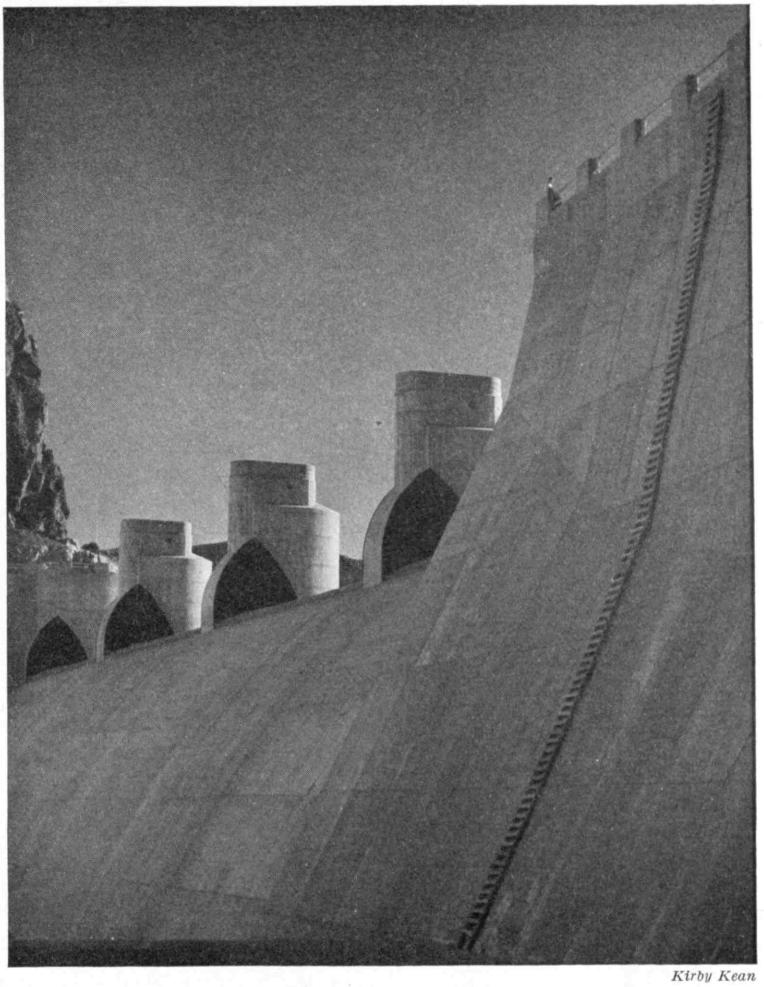
Mr. Fuller's seraglio, along with Drs. Jung and Einstein and television. Finally where neither irrelevant nor fallacious science is involved, Mr. Fuller all too often strains his conclusions far beyond those justified by the facts in hand. This results in wild predictions such as that which says that the delivery of houses by radio-controlled aircraft is in a somewhat imminent future. The reader who can tolerate only the judicial, the sane, the modest will have no truck with Mr. Fuller's book.

But this work is far too important to throw away for these reasons. It abounds, for example, in witty and penetrating criticism of existing mechanisms, of prefabrication, of the patent system, of the practices of architects and bankers. (The book is definitely not on housing, by the way.) The banking system is dignified by becoming Fincap, a splendid Hudibrastic character who pursues his villainies through half the book. There are excellent and carefully worked out statements about the historical stages of patronage, of shelter-designing attitudes, and a very useful analysis of the universal requirements of a dwelling machine. There are tables and charts of the chronology of invention which are interesting in themselves even though we cannot agree with the author in the conclusions he draws from them. The work is full of epigram, of caustic wit, of gentle humor, of crackling simile. It is really rather fun once one catches the tempo.

We may admire also the daring with which Mr. Fuller predicts things for definite accomplishment by mid-1948. By that time he says we shall see beamed radio transmission of power using gold as the reflecting surface, a wholesale migration of the population of the British Isles to America, the principal system of education based on radio and cinema, the mass production of the mechanical chassis of buildings at the million-per-annum mark, a mechanical stock exchange, the substitution of the man-hour for a metallic monetary base, and many others, but "no change in the way of a man with a maid or vice-versa."

Because of its theme and many of its conclusions, the book irresistibly invites comparison with a soberer and greater book which has been published at almost the same time. Unlike Hogben's "Science for the Citizen," [2] our book makes no effort to instruct the layman; in fact, it seems rather to seek to impress him with the mumbo jumbo of science. Where Hogben shuns modern Aristotelian tendencies, Fuller leaps forth to meet them, nay leads the way spreading garlands, piping valiantly through the cosmos. Compared with Hogben's orderly and modest display of the growth of scientific thought, Fuller's material is disorderly, immodest, chaotic, at times nearly nonsensical. His history of science comes perilously close to being nothing more than a collection of historical odds and ends.

[2] New York: Knopf, 1938. 1,082 and 19 pages, $5.00.



Kirby Kean

AT BOULDER: TWO PHOTOGRAPHIC STUDIES
Opposite. *Lake Mead in Black Canyon.* Above. *Nevada Spillway*

On the other hand, viewed as total history and especially for recent times, Fuller does not come off so badly. Like Fuller, Hogben is concerned about misapplications of science, about bad government, about poverty existing at a time when available scientific knowledge makes it entirely unnecessary. But Hogben does not succeed in criticizing the present economic and political order in any very constructive way. Fuller, on the other hand, gets down to cases. If the work of both men could be combined, we might have a greater book than either. But the reader can stir his own salad.

Both authors are in agreement about two fundamentals which are expressed tersely by Fuller: "Evolution has shown that whenever the need arises the art develops" and "neither political convention nor legislation ever brought a potato into being." Both are hot on the trail of doing something about it. Hogben hopes to save society through education of the citizen to the scientific method of thought. Fuller's messianic urge is a little harder to define. One rather suspects that he scorns the ability of the average man ever to absorb enough science to have the inoculation take. He expresses this well when he says: "There is already discernible a greater chasm between the specie-characteristics of the young man working in the scientific laboratory and the average 'salesman' than between the black

and white races." Fuller probably, like Nietzsche whom he undoubtedly admires, believes in the superman but his superman is to be the man of science.

Here, then, are two recent books which, emanating from widely different backgrounds and developed with completely antithetical techniques, nonetheless repeat more vigorously than is usual the somewhat hackneyed exhortation to scientists to live up to their obligations as human beings. This exhortation is rapidly becoming an anthem sung by a loud chorus. But before progressing to the amen, several questions might be asked: Does the average person want this sort of intervention? If he does want it, or if willy-nilly it would in fact be good for him, how is it to be brought about? Are scientists to go into politics? Heaven forfend. Are they to write more books? A futile endeavor. And, finally, what will happen to research itself when, like the rats of Hamelin, the scientists leave their cubicles to dance down the street after a piper who plays the seductive strains of participation in world affairs.

Had we not better admit, after all, that except for his peculiar temperament which fits him so well for the great work he does, the average scientist is no more a three-winged hellion than any other average man? He does not play games better; he is no more athletic; he does not think any faster; he is certainly no more human. But, on the other hand, he is as human — subject to jealousy, to ambition, to dyspepsia like any other man. It would, in fact, be hard to find attributes of his personality that make the scientist a better man to cope with events than any other man. There may be one attribute and that is his possession of the scientific attitude. But this, once possessed, will at once prevent him from trying to draw conclusions in fields where the evidence is still scanty.

Be that as it may, it is no inconsiderable merit of this moon-reaching, often moon-struck, book that its author has at least called a bluff; criticism of his own proposals may well provide other better ones. Unless they can be produced, we had better stop talking about it.

Canned History

WHEN H.M.S. *Hecla* returned from her third fruitless attempt to discover the Northwest Passage, she still had left part of the "embalmed" provisions which had furnished her explorers with the most modern fare then available. Preserved by some thoughtful bureaucrat, two of these venerable tins, each about 114 years old, recently fell into the hands of Professor J. C. Drummond and W. R. Lewis of England, along with a can from a later polar expedition and a tin of tripe packed by Libby, McNeill and Libby in 1880.

Aside from setting up a record which is believed by the authors to be unique in the history of bacteriology, the investigation — the results of which were presented to the Society of Chemical Industry and reprinted in *Chemistry and Industry* (London) — offered a striking tribute to the men who developed the canning industry during the first quarter of a century after its founding. (See The Review, December, 1937, page 71.)

In order to measure the pressure of the gas within these old containers and to insure that a sample be drawn off for analysis under sterile conditions, a special apparatus was used for opening the cans. The gases in the tin of "roasted veal" from the *Hecla*, for instance, were at slightly greater than atmospheric pressure and consisted mainly (85.5 per cent) of hydrogen with only 0.2 per cent of oxygen present. When first exposed, the meat was of a bright pink color almost like salmon but quickly faded to the usual tint of cooked meat. Although the fat had undergone considerable hydrolysis, it still contained more than half as much Vitamin D as fat from freshly roasted veal. The meat itself was excellently preserved and caused no visible ill effects when fed to rats for 10 days.

Also from the *Hecla* was a can of "carrots and gravy" in which no gravy was found but only carrots which appeared as if they had been freshly cooked. The taste was sweet but metallic. In all these cans, it might be added, considerably more metal had been dissolved than would be allowed by today's standards. The canned roast beef carried on Belcher's polar expedition in 1852 was partly decomposed because of a small hole which had formed in the container. In keeping with its shorter existence, Libby's can of tripe showed considerably less metal corrosion than did the other cans, while its below atmospheric pressure gases contained only 13.6 per cent hydrogen and 0.3 per cent oxygen. Although discolored where it had come in contact with corroded parts of the walls, the bulk of the contents was in good condition and caused no discernible harm to young rats which ate the meat for almost three weeks.

A bacteriological check disclosed microörganisms only in the can of roast veal from the *Hecla*, all belonging to a group which is extremely resistant to heat. Only intact cans were investigated. According to the authors, the "survival of spores in the living condition for over 100 years has, we believe, no parallel in bacteriological records."

Two unrelated, perhaps irrelevant but nevertheless interesting, facts in the early history of canning gathered from the paper are: (1) that in 1818 the average cost of canned provisions to the British navy was two shillings, four and a half pence a pound; and (2) that when Sir Joseph Banks, then President of the Royal Society, was asked by a maker of canned goods to write a testimonial, he said with great directness and an equal amount of dignity: "I know of no objection to my name being placed among the very respectable names which are printed in your Prospectus, as giving their testimony in favour of the nutritious qualities of your embalmed Provisions."

Not Interested

THIS month The Review is not interested, out of courtesy to its readers, in the following possible articles: "The Marvels of the Electric Eye," "The Influence of Sunspots on the Daily U. S. Treasury Balance," "The *Magical* Achievements of the Scientist," "Communication with Mars," and "The Volume of Humanity Compared with the Volume of the Empire State Building" (see page 14). Do our readers have other suggestions for articles *not* to be published? Or is there a desire for articles like those described above?

M. I. T. Photo

From Shellac to Symphony

New Perfections in Storing and Re-creating Sound

By George R. Harrison

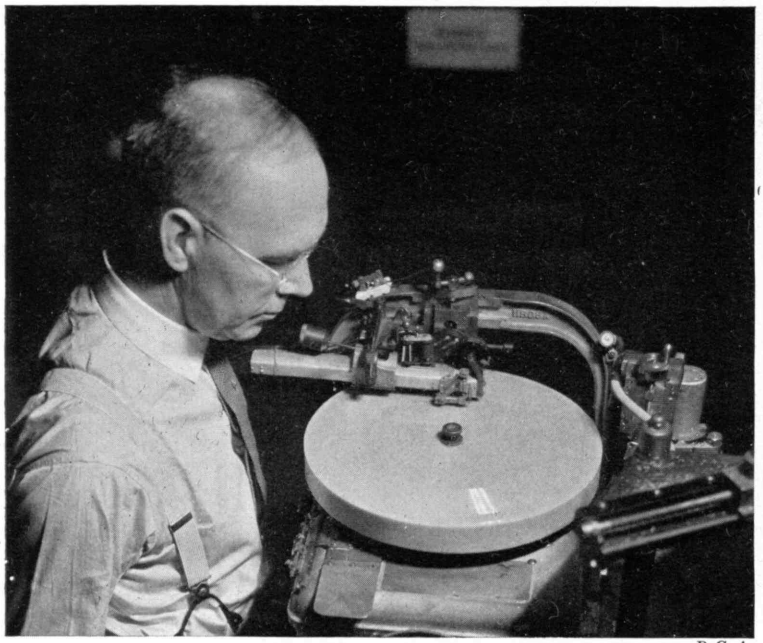
THE SCIENTIST WHO PLAYS STRING QUARTETS WITH HIMSELF — HOW RECORDS ARE MADE — LICKING THE PROBLEM OF NEEDLE HISS — THE DIFFERENCE BETWEEN WOOFERS AND TWEETERS — OSCAR OF THE MICROPHONE EARS — WILL THE RECORD OF THE FUTURE BE A RECORD?

GROWN long accustomed to the scratchy futility of the mechanical phonograph, the world is only slowly realizing the possibilities of more perfect sound reproduction. The electric phonograph and the talking motion picture as we know them are far from perfect in their re-creation of sound, but this limitation now arises almost entirely from the high cost of the apparatus needed to achieve perfect results. Perfectly faithful reproducing devices should eventually be available as commonly as imperfect ones are today.

As recorded and broadcast music has improved in quality, it has been responsible for a surprisingly widened interest in, and greatly increased appreciation of, all music — popular and classical. There appear to be vast possibilities in the development of a new field of musical participation for the amateur, lying intermediate between listening to an expert performance, or to its reproduction, and aspiring, but less often inspiring, personal participation.

A beginning has already been made in using the phonograph as an accompanying instrument. The amateur pianist with a modern reproducer and suitable records can, in his own home, dash into a concerto accompanied by Toscanini and the New York Philharmonic Orchestra quite as readily as if he were Harold Bauer himself and with much less effort on the part of the conductor. Some care is needed in tuning record to piano, and to make this tuning easier special stroboscope disks, disks of paper on which recurring designs are printed, can be obtained. If such a disk is placed on the record so as to turn with it and is viewed in the light of a small flickering lamp, the pattern on the disk will appear to stand still when the speed of the phonograph is correctly adjusted. Then record and piano will harmonize if the piano be kept tuned to the standard pitch used by the great orchestras. Even if the piano be slightly off pitch, the adjustment of the phonograph can be made by ear.

At least one scientist with a musical bent, who possesses a home sound recorder, has gone so far as to play string quartets with himself. He first plays and records the cello part. Then he plays the resulting record through on a reproducer while he accompanies its playing with another part, say that of the viola. The second record is then played while he records it together with his rendition of the second violin part, and so again until all the parts of the quartet have been accumulated. If the quality of recording can be made such that the music does not lose appreciably by successive re-recordings, the only limitation on any performer who wishes to make a full orchestral rendition by himself should be his own virtuosity! Of course there is also the less



R. C. A.

WAX TO RECEIVE

The wiggly groove of the sound track thus cut must conform to its proper shape within a few millionths of an inch

pleasing possibility that an amateur tenor might equally well thus take advantage of the wonders of science and produce his own barbershop chords.

Even the composition of music may be directly affected by the new methods, and science may prove able to remove another confining fetter of art. Great music apparently is not made up by its composers. Only the Tin Pan Alley song writer or his Hollywood successor sits down before a piano and laboriously strikes one note after another in the hope that he will hit a catchy combination of tones or a rhythm which has not been used too recently. A Beethoven apparently hears his symphonies thundering through his mind, and to suppose that the capture of melodic inspiration may be aided by sound recording is not entirely fantastic.

A MODERN sound-recording studio closely resembles a radio broadcasting studio, as well it may, for both are first concerned with capturing sound waves and changing them into equivalent electrical form. The sound to be recorded is caught by a microphone, which must be of much higher quality than is required for telephony, since music sets more rigid requirements than speech. No ordinary telephone transmitter is faithful enough for this purpose, but since workers in the telephone research laboratories have studied the control and measurement of sound waves and their transformation into electrical form more carefully than has anyone else, it is not surprising that the physicist who devised the first high-fidelity microphone, Dr. E. C. Wente, '14, was a member of the telephone research laboratories staff. Other types of high-fidelity microphone have since been developed, but all require the assistance of the vacuum tube amplifier.

The amplified current from the microphone is fed to the coil of a magnet, which wiggles a tiny chisel designed to engrave — while vibrating at a rate which occasionally rises to 10,000 times a second — the moving surface of a disk whirling under it. The miniature plow which thus digs a musical furrow may be pointed with a sapphire or a diamond and must be critically adjusted to cut to exactly the proper depth. A diminutive, silent vacuum cleaner is used to suck up the long threadlike shavings which are dug from the disk, so that these will not interfere with the smooth cutting of the next furrow.

The wiggly groove of the sound track thus cut must conform to its proper shape within a few millionths of an inch, and it must therefore be engraved on a surface which is as flat and smooth as a mirror. Thin films of wax spread on thick metal plates or polished cakes of special soap more than an inch thick are used. (This soap, which is firm yet soft enough to be cut with an engraving needle, would hardly be suitable for cleansing purposes; it is real soap nevertheless.) If this original record were to be played on an ordinary phonograph, it would be damaged by the great pressure with which the sharp needle would dig into its soft surface. Records which are to be played repeatedly must be made of harder stuff, and a complicated process of reproduction is needed to get this groove transferred to the thousands of commercial records which are to carry it.

Any tiniest change in the shape of the sound groove during this reproducing process will cause the re-created sound to differ from the original. Scratches or dust marks will be heard as noise; rounding of corners on the wave patterns will cause the sound to be unnatural and distorted. Only the painstaking methods of the research laboratory could have made possible the delicate control required for so intricate a process.

The first step is to coat the original record with gold, which usually is done by electroplating. An old method of gilding which is again coming into favor involves putting the record in an evacuated glass container where gold atoms can be sprayed over it electrically until a thin gold layer is built up. This layer of gold is then strengthened by plating it with copper until it can be stripped from the record as a metal shell on which the sound grooves stand out in golden relief. This shell is then used as a negative mold from which positive metal duplicates can be made, and these in turn are used to produce the chromium-coated stamping negatives which serve to press the final records from warm soft dough by the hundreds.

The sight of hundreds of steam-heated presses stamping out phonograph records is likely to give rise to that exaltation which is occasionally felt on viewing one of man's accomplishments in fashioning nature to his ends. The juxtaposition of the results of art and of science seen under such circumstances may produce a peculiar emotional reaction.

Before each record press stands a young woman, at her side a flat hot plate on which rectangular slabs of dough — made from shellac mixed with clay and other materials — are kept soft and pliable. When the press

opens she inserts a mass of this dough between the two chromium-plated record molds which carry the replicas of the wavy lines of sound on their surfaces, closes the jaws of the press, and releases a force of over 60 tons which squeezes the mass into a thin disk, impressing on its upper and lower surfaces the sound-track grooves from the master records. A moment later a spurt of water cools the press internally, the jaws open, and the operator takes from the mold a completed disk record, ready (after its rim has been burnished) to be played. At one moment we see a mass of dough; 30 seconds later it emerges from the press transformed — the "Prelude to Lohengrin"! Not the least wonder of science is its ability to convert shellac — excreted by an insect — into a vehicle for profound emotional experience.

Most records of the type played in the home are made from shellac mixed with coloring materials, with clay or some other filler material added to give hardness. The particles of filler add somewhat to the background noise, but something of the sort is necessary to keep the needle from cutting the soft shellac. If a fresh steel or fiber needle is set on a record, it may not fit the sound groove, but a single turn of the disk will shape the needle so that its pressure soon falls to normal.

Needle scratch, coupled with distortion of the sound, has always in the past betrayed the phonographic source of reproduced music. Record materials must be extremely pure and free from fine particles if background noise is to be eliminated. When the noise problem was first attacked scientifically, two years of research resulted in the reduction of needle scratch to one-fourth of its previous loudness. Now this rasping annoyance has been completely removed in the best apparatus and is being eliminated rapidly from phonographs and records of cheaper grade.

Seldom has chemistry come more importantly to the aid of physics in industry than by the provision of new substances to hold the sound track. Shellac is still widely used because of its cheapness, but new plastic materials, such as vinylite, which are less brittle than shellac, which carry music better, and which produce less scratch, are being used increasingly. Use of these materials results in great saving of space and decrease of breakage for commercial recording and for other purposes where expense is less important than it is in the home. In broadcasting studios it is not unusual to see great musical disks half again as big as an ordinary record but only one-third as thick, so flexible and tough that they can be bent nearly double without breaking. Since sound is stored only on the surfaces of a disk, the thinner the latter can be made the less material will be required for holding a given period of melody. An ordinary suitcase, which might be filled by enough cylindrical records to play for three hours, would hold at least 30 hours of speech or music packed on disks. Some modern records are hardly thicker than a sheet of Manila paper; indeed paper itself, coated on both sides with resinous materials which can be softened while the groove is being pressed but which can later be hardened by baking, may furnish the principal recording material of the future.

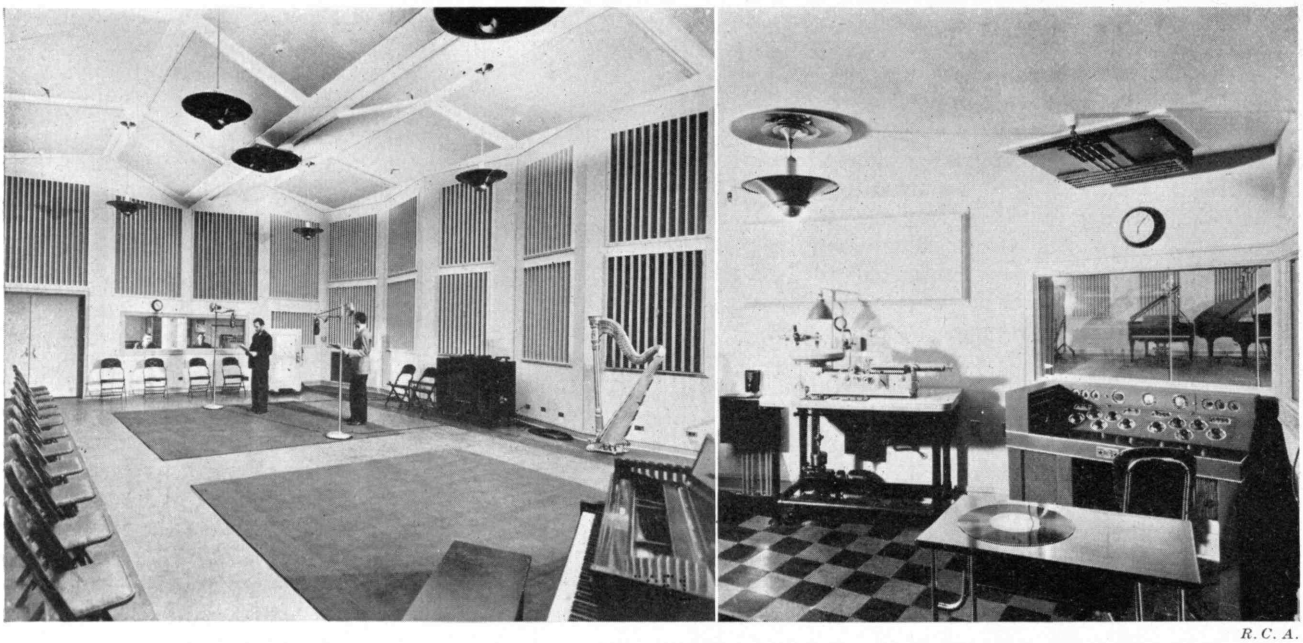
The number of times a record can be played depends on how carefully it is handled, but it should stand 50 playings before the quality of its music deteriorates seriously. Two hundred playings is sometimes given as standard, but most records show considerable wear even after 10 playings, unless one of the most modern, lightweight needle holders is used. Careful measurements are made in the control laboratories on all recording materials, and a record is considered to be worn out when the noise made by the needle on the supposedly silent part of the record has increased to double its original value.

Thorn and fiber needles are widely used for playing records in the home because they reduce needle scratch, but they do this somewhat at the expense of musical quality. A needle of woody material does not transmit

R. C. A.

BIRTH OF A RECORD

At one moment we see a mass of dough; 30 seconds later it emerges from the press transformed — the "Prelude to Lohengrin"



R. C. A.

ECHO-PROOF

The latest in phonograph-recording studios. The walls and ceiling are "staggered" to avoid echo. Behind the grilles is sound-absorbent material, and by opening or closing the grilles the acoustics of the room may be changed to suit any type of recording.
Right. *The control booth*

high-pitched vibrations along its length so well as does one of stiff metal and thus tends to eliminate scratchy sounds, but at the same time it reduces in intensity the higher overtones of speech or music. Since fiber needles wear away faster than the record material, records which have been played with such needles last longer, and a good needle of this type should play a dozen or more records without resharpening. Hard needles of tungsten or chromium-plated steel last for many records and give good tone quality but may wear the record material unduly. The commonly used steel needle gives a compromise between record wear and tone quality but wears away rapidly itself.

An ideal solution to the needle problem has been reached in a permanent diamond-pointed needle which is fitted to an attachment so light that neither needle nor record is worn appreciably in hundreds of playings. Since such a device is too costly for use in any but the more expensive installations, further commercial research is required to find a cheap solution to the problem.

WE are accustomed to associate sounds of one quality with violins, of a different quality with canaries, and of a third quality with streetcars. Actually these differences in quality arise from differences in the intensities of the various harmonics in the respective sounds, which are reflected in the differing shapes of their respective wavy lines. The sound from one canary differs only in line shape from that of a thousand tuning forks, or the squeak of a barn door on rusty hinges, or any other sound. Now if a piece of sheet iron or cardboard could be made to vibrate in such manner as to produce sound waves identical with those from a canary, for example, a canary is what the ear would hear, and to do this it need only vibrate in accordance with the contours of the appropriate wavy line. If a person could wave his hands rapidly enough a few inches from his ears, he could produce music which would sound exactly like that from a hundred-piece symphony orchestra, though to do so would require that he be able to move his hands to and fro irregularly at the rate of 15,000 times a second! This is exactly what a loud-speaker is supposed to do. It is merely a piece of cardboard which is wiggled by an electromagnet in accordance with the dictates of a varying electrical current, this current having arisen in a radio, a telephone, or a phonograph, wherein it has been molded to fit the contours of some sound wave.

A small vibrating diaphragm, two or three inches in diameter, produces sounds too faint to hear except in an earphone, and the early attempts to strengthen these sounds by sending them through a horn had fundamental limitations, for most horns suffer from the innate egotism called resonance. Since a horn is somewhat of a musical instrument in its own right, when asked to transmit a vibration frequency which happens to coincide with one of its own favorite tones, it will respond overenthusiastically. A similar result might be expected if a beautiful poem were to be read by a European dictator who shouted ten times louder than usual whenever he came to the word "I." The perfect loud-speaker should respond with equal deference to vibrations of all sorts, whether low-pitched or high.

When more faithful loud-speakers were needed for radio receiving sets, the problem of developing them was attacked by Drs. Chester W. Rice and Edward W. Kellogg of the General Electric Laboratories. These scientists discarded the horn entirely and used a larger diaphragm, usually in the form of a flat paper cone, which was found to respond more evenly to the tone spectrum. Many of the first (*Continued on page 36*)

Molecules in Your Crankcase

That Shadowy Property Called "Oiliness"

By Milton B. Dobrin

Progress in Understanding Lubrication — Boundary Lubrication — Molecular Films — Molecules That Cling Like Leeches — Studying Films with Electrons

In the fascinating domain of things so small that not even the microscope can reveal them to our eyes, the molecule occupies an anomalous position. It is the largest of the fundamental structural units of which all matter is composed and is the only one which we can identify with substances familiar to us in the world of ordinary experience. What a substance is depends on the molecules of which it is composed; and whether we will observe it in the crystalline, amorphous, liquid, or gaseous state depends entirely upon the way these molecules are arranged with respect to one another.

Because of this dependence of mass properties upon molecular properties, a study of the structure and arrangement of molecules is not only of interest to the theoretical physicist and chemist but has become a key to the solution of many practical problems involving materials and their usage. A generation ago the individual molecule could not be considered as anything but a purely statistical entity, which, because of its small size, we could never hope to see or learn very much about. We still cannot see molecules, but recent tools, such as the x-ray and the electron beam, now make it possible for us to envisage molecules at least as well as if we could magnify them directly to observable proportions.

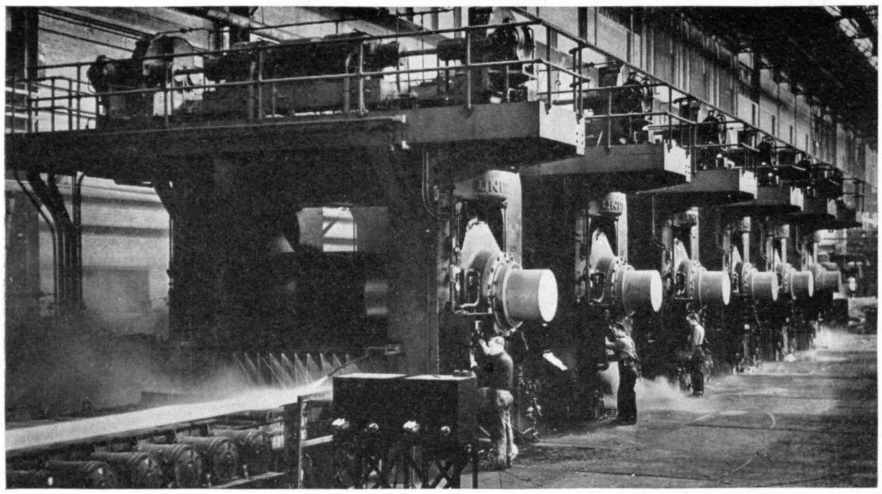
Lubrication, a field which few would associate offhand with the abstractions of modern science, furnishes one of the best examples of how the use of these tools and techniques that give us an understanding of molecular structure can be applied to practical advantage. The organic compounds which are found in lubricating oils are composed of several types of molecule. Most of these have the form of closed chains, with carbon atoms constituting the chief links. In addition, however, there are constituents, usually in small quantities, whose molecules are like long, straight chains. Under many conditions encountered in practice, the adequacy of lubrication will depend greatly upon how these straight chains are oriented with respect to the metallic surfaces involved.

Ordinarily, however, the film of lubricant between any two moving parts of a machine is so thick that the action of the individual molecules in the oil need not be considered. Such a layer can be treated as a perfect fluid in which the molecules all have a random arrangement, pointing indiscriminately in all directions. Whether or not the film will be thick enough to prevent damaging contact between the metallic surfaces will depend in part upon the viscosity of the liquid — a property of all fluids which is intuitively familiar to anyone who has ever tried to pour syrup or molasses. A liquid with a high viscosity will not be so easily squeezed out from between the moving parts as one whose viscosity is low.

As long as the oil can be treated as a perfect liquid, its lubricating action in machine parts can be studied by applying the classical laws of hydrostatics and hydrodynamics. This was first done more than half a century ago by the English physicist and mathematician, Osborne Reynolds, who investigated the lubrication of a journal rotating in a sleeve bearing. He demonstrated mathematically that the journal when in motion actually "floats" in the oil in such a way that there is no metallic contact between the sleeve and the shaft. The journal is held up not by buoyant forces of the sort that keep a cork afloat but by the viscous drag set up in the oil film by the turning around of the journal. When the bearing is running without a load, the shaft will assume a position concentric with the sleeve, and the clearance between the journal and bearing as well as the thickness of the oil film will be the same on all sides of the bearing. But when an external load is applied, the center of the journal shifts its position, not downward, as might be expected, but laterally, and the eccentricity between the journal and bearing will depend upon the load. The minimum thickness of the oil film will then be determined by how closely the shaft approaches the bearing wall, and this is determined, in turn, by the amount of load applied.

As a step in obtaining these results, Reynolds had to derive an equation for the distribution of pressure in an oil film separating any two moving surfaces — an equation that has turned out to be the basis for nearly all further contributions to the theory of thick-film lubrication. In 1904, Arnold Sommerfeld, who, by the way, is known today mainly for his outstanding work in atomic physics, applied this equation to find out exactly how the pressure distributes itself around an imaginary bearing of infinite length. Knowing this, later investigators were able to determine just how the friction within a real bearing should depend on such measurable factors as the viscosity of the lubricant, the speed of the journal, and the load on the shaft. The first curves showing these relationships were published by Mayo D. Hersey, '09.

The validity of these theoretically derived results could be tested only by experiments on actual journal bearings, and when such tests were made it soon became evident that the theory, which holds relatively well when the lubricating film is thick, breaks down when the film thickness gets below a certain critical value. Under the conditions of speed, load, and viscosity necessary for



WHERE LUBRICATION IS OF PRIME IMPORTANCE

The finishing train in Republic Steel's 98-inch continuous strip mill in Cleveland, fastest ever built. Strip steel is rolled out of the last stand at speeds reaching nearly 24 miles of steel per hour

the maintenance of a thick film, the observed friction closely approaches the values predicted by the classical theory. Otherwise a marked divergence is observed between the theoretical predictions and the experimental results, with the actual friction becoming much greater than that which is called for by the theory. So pronounced is the line of demarcation that engineers give separate names to the kinds of lubrication encountered on each side of that point where the observed friction leaves the theoretical curve. Where the actual friction is in accordance with hydrodynamic theory, the lubrication is called viscous, because here the oil film is sufficiently thick to separate the metallic surfaces completely, and the actual friction is due only to the viscosity of the oil. But where the observed values deviate from the theoretical, the condition is known as boundary lubrication, for under the circumstances that give rise to it, namely, low bearing speed, low viscosity, high load, or a combination of these, the minimum thickness of the oil film will no longer be sufficient to prevent the minute but unbuffered projections from the moving metallic surfaces from rubbing directly against each other. This contact is what causes the observed jump in the friction within the bearing.

Friction losses in a bearing, like energy losses in an electric power line, can never be eliminated altogether, but they can be reduced to a minimum by proper design of the bearing. Even in the most expertly designed machines, however, there will always be circumstances under which the film will break down so that the lubrication is of the unwelcome boundary type. This will be the case whenever a piece of machinery is just starting or coming to rest, when its motions are rocking or reciprocating, or when there are any rapid fluctuations in the speed or the load. Since the danger of permanent damage is greatest under boundary conditions, this type of lubrication generally presents the most serious problems to be encountered in the whole field.

In view of this fact, it is unfortunate that boundary lubrication is such a complicated process that no mathematical machinery of the sort that has been developed for studying ordinary viscous lubrication is available for handling its problems. The problem is complicated because under boundary conditions the lubricant can no longer be looked upon as a perfect fluid but as an aggregation of individual molecules, each type of which has a different role in the lubricating process. Even the established physical properties (such as viscosity) of oils in bulk become inadequate to explain this kind of lubrication. For when the load, bearing speed, and viscosity are identical, the observed friction under thin-film conditions is still found to vary considerably with the particular lubricant that is used. To account for this difference, a rhetorical property called "oiliness" has been invented for the oil and might be defined as that property in a lubricant which gives rise to the divergences in the actual friction that is observed under conditions of boundary lubrication. As an explanation this concept is scarcely more satisfactory than that of the professor in one of Molière's plays who declared that opium induces sleep because of its dormitive virtue. Research of recent years has, however, cast more light upon this shadowy property known as oiliness, indicating that it depends to some extent at least upon the regimentation of the molecules within the lubricant which come closest to the metallic surfaces being protected.

Because of the complications that would be involved in basing a theory upon the behavior of individual molecules, the study of oiliness phenomena has been carried on almost entirely by experimental, rather than by theoretical, methods. The most potent technique that has been employed has been the investigation of films of organic liquids only a few molecules thick. Lord Rayleigh, in 1899, while making measurements of the effect of small quantities of oil upon the surface tension of water, first detected the tendency for certain oils to spread out on water until of monomolecular thickness. Marcelin observed the phenomenon more directly when he allowed a single droplet of oil to spread upon a water surface until the film reached a limiting area and would spread no farther. Determining the volume of such a droplet and measuring the maximum area of the film, Devaux divided the former by the latter to calculate the thickness of the oil film. This turned out to be about 10^{-7} centimeters — a distance known to be of the order of one molecular diameter.

In this earlier work on molecular films, the assumption was generally made that organic molecules were spherical in shape and floated on water just like tiny rubber balls. But soon this oversimplified picture had to be reconstructed. The new picture grew up mainly as an answer to the question of why some organic substances will spread on water and why others will not. Substances consisting only of carbon and hydrogen atoms were known to form a lens that (*Continued on page 40*)

The Decline of Cookbook Engineering

Notes on the Cambridge Meeting of the International Congress of Applied Mechanics

BY NORBERT WIENER

THE subject of applied mechanics is a very old one. Its beginnings are so closely associated both scientifically and personally with pure mathematics that not until recent times has any distinction between the two professions become possible. Archimedes, the discoverer of integration and of hydrostatics, the great military engineer of Syracuse, is the prototype both of the pure and of the applied mathematician.

While applied mechanics is an old subject, it is one whose content must continually shift with the shift of the fields of interest of the engineer. If there had been any such congress in the 18th Century as took place at M.I.T. and Harvard in September, it would have concerned itself with watchmaking, geodesy, and the technique of navigation. In the 19th Century the spiritual ancestors of the participants in the recent congress would have been concerned with the rolling and pitching of ships, with the design of bridges, and with the development of new valve linkages for the steam engine. These subjects have not died out as matters of interest to a congress of the present day, but they have been pushed into the background by topics more than half of which arise in connection with aerial navigation. Turbulence in wind tunnels, the examination of materials by photo-elastic methods, refined theoretical studies in elasticity, the determination of the lift and drag coefficients of airfoil sections — all these were among the central topics of the recent congress.

It is an interesting reflection that the entire morale of engineering in fields apparently remote from aeronautics has been raised and stiffened by the development of the airplane. The airplane is a structure which very nearly fails to work, and only by supreme intelligence in design can it be made to work even in an approximately satisfactory way. The result is that good old-fashioned cookbook engineering, which went by rule of thumb and covered up all incompetencies of design by a bang-up big factor of safety, has gone into the discard. However, the new investigations arising out of aero[illegible]ics are quite as useful in old fields of work. Economically speaking, aeronautical research has paid the overhead for a general improvement of engineering research all along the line.

One result of this is that the recently passed Congress of Applied Mechanics, while it had representatives from civil and mechanical engineering, from pure mathematics, from the factories of the heavy industries, from universities, and from governments, was predominantly a congress of people interested, in one way or another, in aeronautics. Among these we must count designers, experts in hydrodynamics, meteorologists, and those in many other positions. An extremely dramatic consequence of all this is that we had the privilege, here in Cambridge, in a time of the maximum international stress and strain, of seeing among us technical leaders of the air forces of all the great countries and of observing in their personal relations how great are the loyalties and friendships of a profession, how great is the respect of men in one country for their colleagues and teachers in another, and how fundamentally decent people are.

From Germany the dominating personality was Professor Ludwig Prandtl of Göttingen, and no man commanded greater respect or applause from his colleagues. Another great personality was Professor Theodor von Kármán of the California Institute of Technology, the man who was responsible for the technical end of Austro-Hungarian aviation during the War, recently a professor in the German Polytechnic at Aachen, from which he was expelled for reasons of race. It was interesting to note that on one occasion Professor Prandtl, who was official chairman of the section on turbulence, handed over his chairmanship to Professor von Kármán.

It would be invidious to try to draw the line anywhere between those whom we name and those whom we do not, but a few other striking personalities are worth mentioning. Professor G. I. Taylor of the Royal Society presented some of his fascinating new researches on turbulence, many of which stood in intimate relation to the work of Dryden at Langley Field. Professor Joseph Pérès of the École Polytechnique in Paris represented the pure mathematician turned engineer. Two commanding figures among the Russian refugees attracted the attention of all: Riabouchinsky of Paris and Timoshenko of Stanford.

The social standards of international scientific congresses are exacting, and to entertain with proper dignity and cordiality a group from the four corners of the earth is not easy. The recent congress was a demonstration that our community can handle such a situation in a way second to that of none of the European hosts of similar gatherings. There is a tremendous thrill in bringing together so many great names in juxtaposition and in the chance of making personal contacts with those whom one has known previously only by reputation. The interchange of discussion in different languages, fatiguing though it be, has something very exciting about it. Most inspiring of all was the demonstration by the group of personal and scientific solidarity at a moment when no one felt that world catastrophe was far off. We were left with a feeling that if the worst comes to the worst and war devastates the world, there is so much good will, decency, and so much appreciation of human values from whatever country or race they may come, that we cannot altogether despair of the future.

Why Wind Tunnels?

What They Have Done — What They May Do

By George W. Lewis

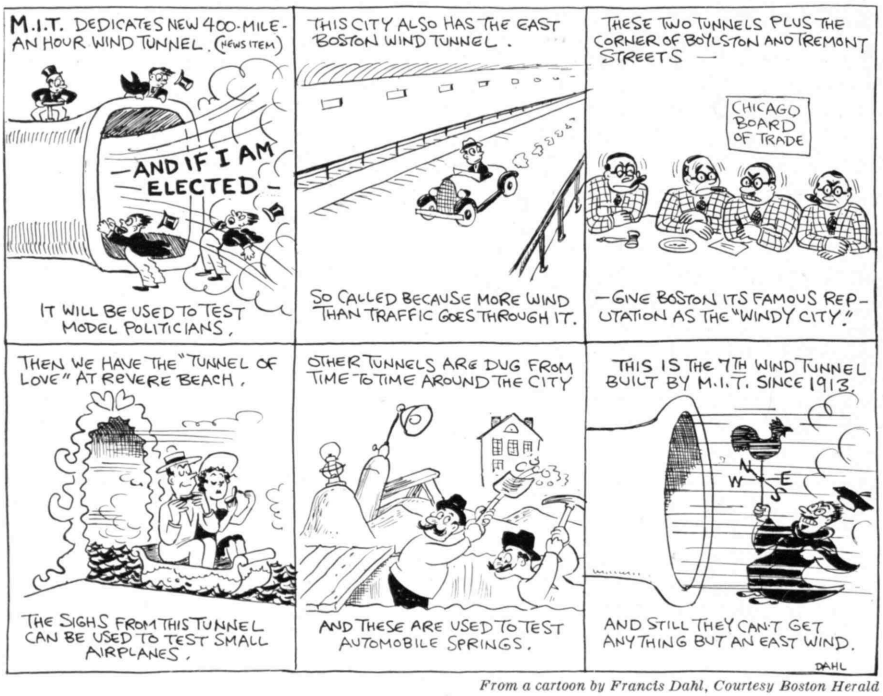
THE Wright Brothers Wind Tunnel at M.I.T. was dedicated on September 12 as a memorial to the methods of controlled experiment applied by Orville and the late Wilbur Wright in their historic conquest of the air.

Designed to simulate flying conditions from sea level to the substratosphere altitudes up to 37,000 feet, the new tunnel will produce wind velocities up to 400 miles an hour. It is planned to operate at a maximum pressure of four atmospheres, or approximately 45 pounds to the square inch, and at a minimum of one-quarter atmosphere, which is approximately 75 per cent of a perfect vacuum. As explained in The Review last June, compression of the air to four atmospheres simulates conditions of full-scale flight, while reduction to one-quarter atmosphere represents the density of the air at high altitudes and gives higher wind speeds for the power available (2,000 horsepower).

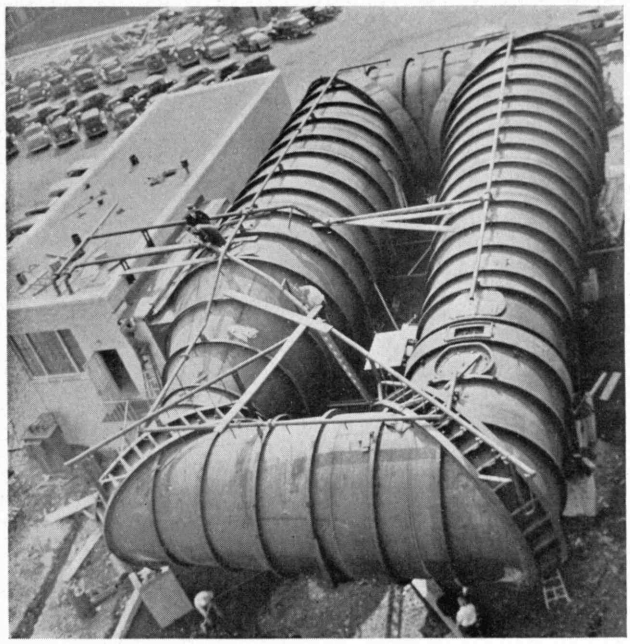
The article below is drawn from one of the addresses presented at the dedication of the tunnel. For a note on the other speakers and what they spoke about, see page 32. The Editor

IT is not only a pleasure but a privilege that I appreciate deeply, to participate in the dedication of the new Wright Brothers Memorial Wind Tunnel at the Massachusetts Institute of Technology. Dedicating a newly constructed wind tunnel seems to me somewhat like christening a newly born child; we are dealing with something that is strange individually though familiar generically. Although we know in general what results are obtained from wind tunnels, it is interesting to speculate, as each new tunnel comes into existence, regarding the contributions to the progress of aviation which may come from the new tunnel's test chamber. On this, the official day of birth of the Wright Brothers Wind Tunnel, the only statement we can make with certainty is that the provision of such equipment is consistent with the wisdom and long-range vision that have characterized the operation and development of the M.I.T. My purpose in these brief remarks, therefore, is to discuss the significance of wind tunnels to the general course of aeronautical progress.

Of the engineering sciences, aeronautics is unique in this respect, that it is more critically dependent than any other upon the proper conduct of experimental research and upon the availability of correct scientific information as a basis for engineering design. In the other fields of transportation, progress has been steady and straightforward. In naval architecture, for example, we recognize that the man who launched the first dugout could do so with reasonable confidence that it would float and sustain his weight. Likewise with land vehicles, the designer of the first cart could have full confidence that it would roll along the ground when completed. In aviation the situation was very much different, for in this field the pioneer had to obtain direct experimental evidence as to the lifting capacity, stability, and controllability of his machine before he could take to the air with any degree of certainty that his first flight would be successful. Early aeronautical scientists found themselves in a dilemma when they seriously attacked the problems of flight. The aerodynamic knowledge needed for successful design would not be available until scientists had a flying machine with which to conduct experiments. Fortunately, a simple solution was found in the principles of dynamic similarity applied to tests on a scale model. Various methods were employed to obtain the desired relative motion of air past the model. For example, some experimenters used a whirling arm rotating on a fixed pivot and carrying the model through still air at the outer end of the beam; some mounted the models on carriages and towed them in still air; some dropped the models from considerable heights or made use of gliding models; and some attempted to make use of natural winds in exposed locations. All of these methods, however, with the possible exception of the whirling arm, were found too cumbersome, too inconvenient, or too inaccurate to be generally suitable for determining (*Continued on page 50*)



From a cartoon by Francis Dahl, Courtesy Boston Herald



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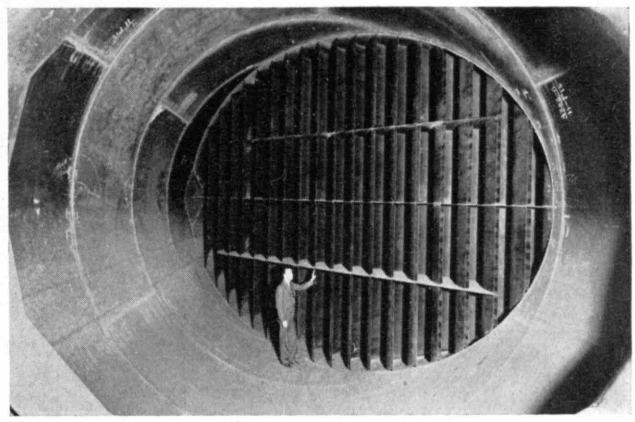

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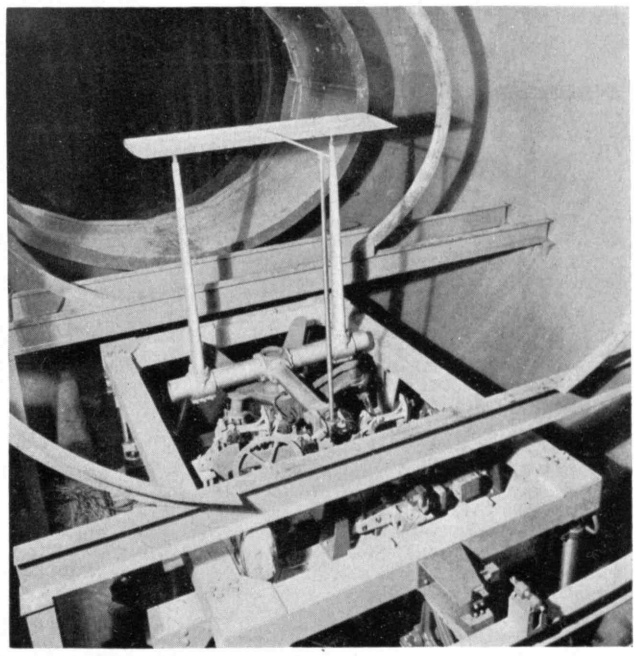


C

A PRIMER OF WIND TUNNEL ANATOMY

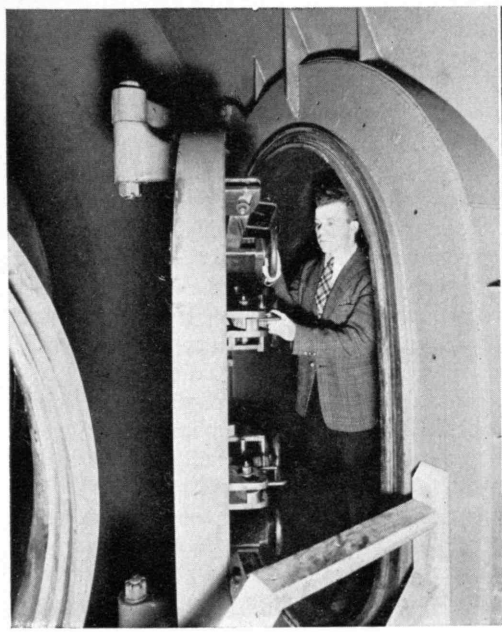
A. In form, the Wright Brothers Wind Tunnel at M.I.T. is a ribbed and rectangular doughnut, 44 feet wide and 90 feet long. Three miles of welded joints stitch the heavy steel plates together. In the picture, workmen are installing the cooling pipes that will spray water over the tunnel when the 2,000 horsepower motor pumps 400 m.p.h. winds around the circuit.

B. The air stream is guided around the four corners of the tunnel by crescent-shaped vanes.

C. Delicate balances record the behavior of models under test, and this information is transmitted by electrically operated instruments to an adjoining laboratory building.

D. This heavy door on floating hinges gives access to the test chamber for installing models in place and making adjustments.

E. The six-bladed, variable-pitch propeller nearly 13 feet in diameter is driven by an A.C. motor cooled by a special ventilating system.



D

E

Do You Know . . .

ZOSIMOS OF PANOPOLIS (late 3d or early 4th Century). Alexandrian School. Had a wide knowledge of practical chemistry of metals and alloys and of chemical processes, sand bath, water bath, distillation. Had a dualistic theory of the composition of the metals.

KO HUNG (c. 281–361). The most distinguished of the Chinese alchemists. Wrote extensively on alchemy and on practical chemistry and described clearly many experiments in the chemistry of lead, mercury, and tin. Probably the first man to manufacture tin foil.

JABIR IBN HAYYAN (c. 721–817). Arabic. Acquainted with sulphuric and nitric acids, alkali, alum, corrosive sublimate, and with many other chemical substances. Described cupellation. Sulphur-mercury theory of the composition of the metals. The Latin writings of "Geber" were an important source of the chemical knowledge of Latin Europe.

ROBERT BOYLE (1627–1691). English. Careful experimenter and clear thinker on chemical problems. Defined "element" but was unable to find an experimental criterion for determining the applicability of the definition. Had a corpuscular theory of matter. Discovered methyl alcohol, acetone, phosphorus, and so on.

MIKHAIL VASILIEVICH LOMONOSOV (1711–1765). Russian. Defined physical chemistry and listed the problems for its study. Believed in the conservation of matter, which he held to be atomic, foresaw isomers, and had a kinetic theory of gases. The first in the world to introduce the laboratory teaching of chemistry to university students.

ANTOINE LAURENT LAVOISIER (1743–1794). French. Founded modern chemistry, using weight for the interpretation of chemical reactions. Proved the nature of acids, of combustion, and respiration, and the composition of water. Developed a new chemical nomenclature.

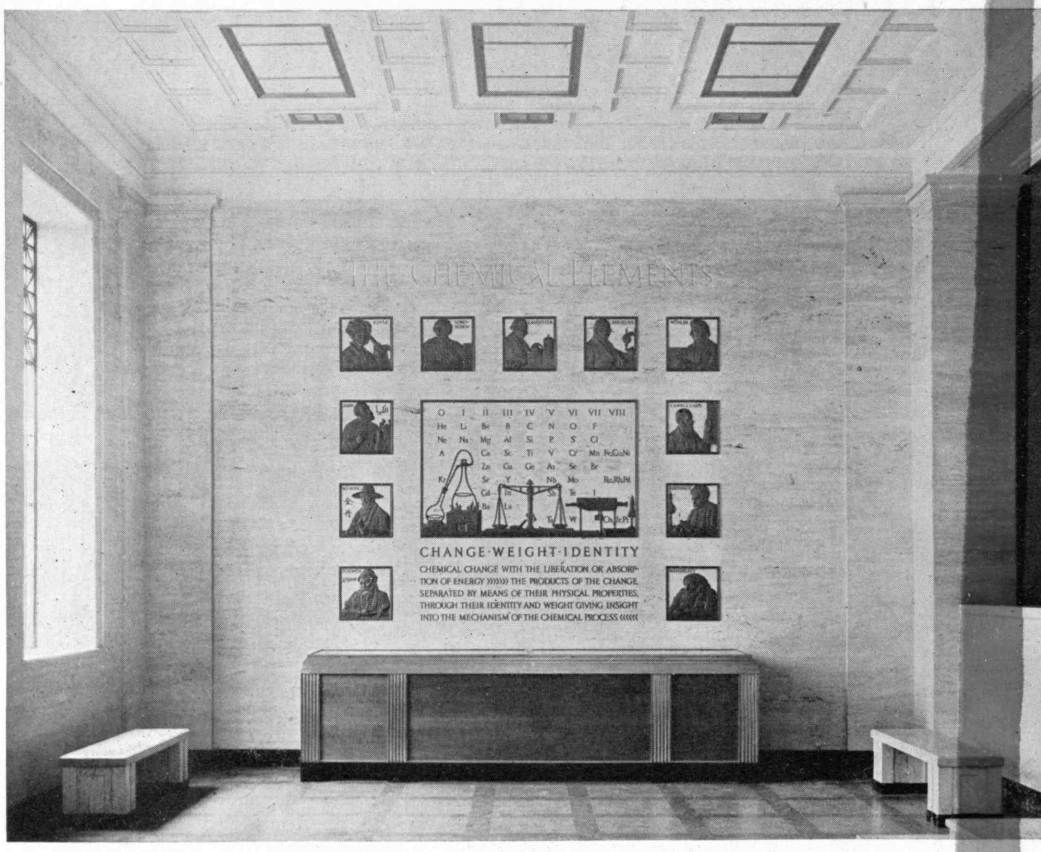
JÖNS JAKOB BERZELIUS (1779–1848). Swedish. Discovered cerium, selenium, and thorium. Isolated silicon, zirconium, and titanium. Developed analytical methods, drew up a table of equivalent weights, devised symbols for inorganic compounds. Studied many organic compounds. Catalysis.

FRIEDRICH WÖHLER (1800–1882). German. Isolated beryllium, aluminum, boron, and silicon. Studied peroxides, hydrides, cyanogen, benzoyl, and so on. Synthesized urea.

STANISLAO CANNIZZARO (1826–1910). Italian. Secured the acceptance of the earlier views of Gaudin, Ampère, and Avogadro, and established correct atomic weights from vapor-density data. Created order in chemistry. Contributed to organic chemistry.

MARCELLIN BERTHELOT (1827–1907). French. Founded organic synthesis from the elements (acetylene, ethylene, alcohol, benzene, and so on); fixation of nitrogen, thermochemistry, and the science of explosives.

DMITRI IVANOVICH MENDELÉEV (1834–1907). Russian. Periodic classification of the elements, basis for the later unitary theories of the constitution of matter. Predicted the existence of elements which have since been discovered. Contributed to inorganic and organic chemistry.



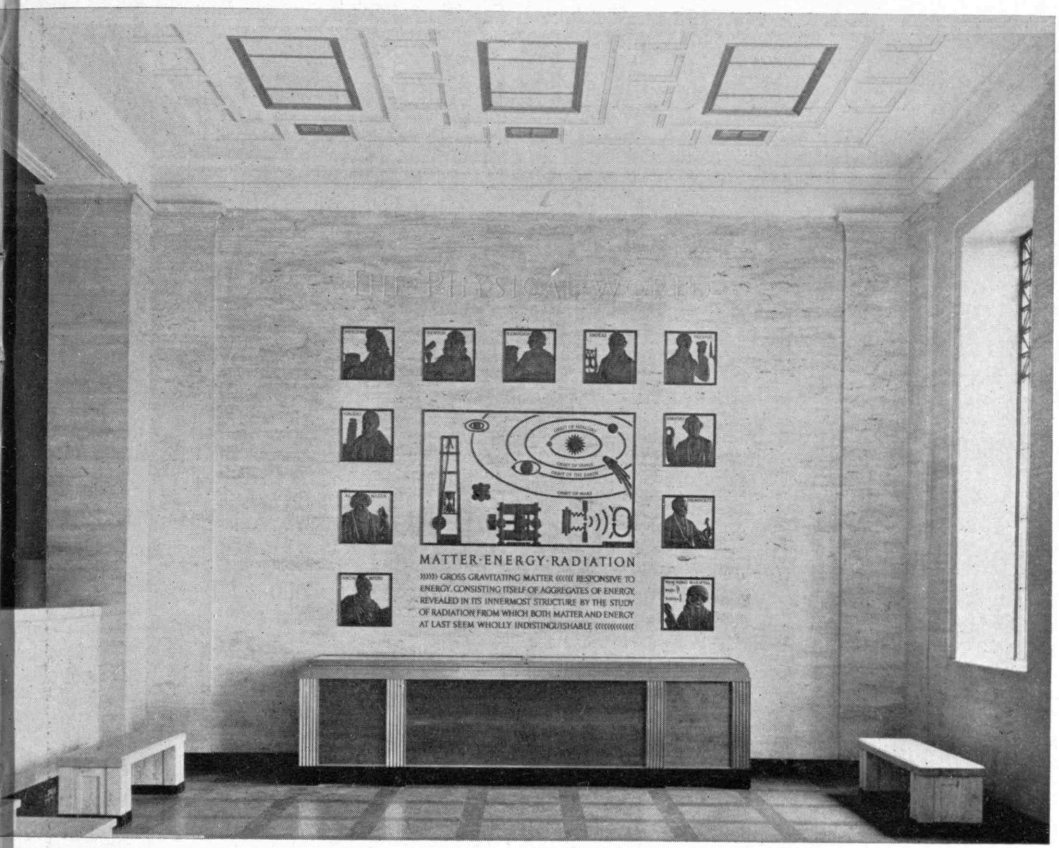
Bronze Murals of Men and

STRIKING among the changes at the Institute in recent years has been the addition of amenities, decorations, and exhibits to relieve the sterile reaches of corridors and entrance ways and to give such utilitarian spaces a part to play in stimulating the mind and delighting the eye.

The latest of these embellishments, not counting the domed and pillared vestibule (see page 31) of the new Rogers Building, are shown in the photographs above. These bronze murals in the foyer of the Eastman Research Laboratories of Physics and Chemistry portray high spots in the development of physics and chemistry and some of the great men who have contributed to this development. Made possible by the use of monies from the Forris Jewett Moore Fund, given by Mrs. Moore, the project was conceived by the committee in charge of the fund and executed by architect G. Thayer Richards.

Mankind's study of the chemical elements throughout history is illustrated on one wall. As clues to chemical knowledge, change, weight, and identity were successively of greatest importance. Using crude equipment such as the alembic which is here shown, the alchemists and early chemists were pioneers in the investigation of chemical change and its products. Later, when Lavoisier and his followers realized that greater insight might be gained by weighing the products of change, the balance came into extensive use as a chemical instrument. Bunsen's spectroscope also takes its place in the mural because it was the first instrument which enabled scientists to detect traces of the elements. Portrayed on this wall are three alchemists (Alexandrian, Chinese, and Arab) and eight chemists. The most modern of these, Mendeléev, devised a periodic table which coördinated man's knowledge of the chemical elements. In the center plaque of the mural this table is indicated.

The physical world and man's discovery of its laws are suggested on the opposite wall of the foyer. Phenomena pertaining to matter, energy, and radiation have been studied by investigators of succeeding epochs. Galileo,



Ideas Mighty in Science

Huygens, and Newton learned much about motion and gravitation by computing the forces at work in pendulums and in heavenly bodies; whence a pendulum and the planetary system find places in the mural. The laws of electrical energy discovered by Ampère, Faraday, and Maxwell were first utilized in such early machines as the Gramme dynamo which is here shown. A diagram of the Hertz oscillator, the basis of all radio wave experiments, commemorates early research in radiation. The microcosmos is represented on this plaque by an atomic lattice arrangement of a simple crystal (NaCl). Pioneer investigations on statics, optics, and heat were contributed by other scientists portrayed on this wall.

The display cases placed against the walls of the foyer are an essential part of the composition and bear the same relation to the murals esthetically as do flowerpots to the plants they hold. Built of extruded bronze with gray harewood panels, the cases may be adjusted to accommodate deep, as well as shallow, exhibits. "Benches, not too comfortable" were also among the furniture originally requested. Four have been built, of stone to harmonize with the walls.

The new ceiling is designed to be unobtrusive. Heavy beams are eliminated as far as possible, acoustical plaster is used, and all lights are flush with the surface. Emphasis is placed on lighting the walls rather than the ceiling or floor. Nine large luminous panels of low intensity, glazed with flashed opal glass set in extruded bronze frames, provide mild general illumination without glare. In addition, floodlights built into the ceiling over the end walls emphasize the bronze murals.

Because these murals constitute a chapter in the history of science, presented so that even they who run may read, The Review supplements the story told in bronze with thumbnail sketches of the scientists whose portraits in relief are included. Before reading these descriptions by Professor Tenney L. Davis, '13, run through the names, check them against the portraits, and see how many you can identify.

Do You Know . . .

ARCHIMEDES OF SYRACUSE (c. 287–212 B.C.). The greatest mathematician, physicist, and engineer of antiquity. Laid the foundations of statics and hydrostatics, enunciated the notion of specific gravity, invented many useful machines and mechanical devices, compound pulley, endless screw, and so on.

ALHAZEN, Abu 'Ali al-Hasan (c. 965–1039). Arab, flourished in Egypt. Astronomer, mathematician, physicist, physician, and one of the greatest students of optics. An experimentalist. Understood the lens, refraction, vision, and so on. A Latin translation of his work on optics exerted a great influence on Western science and did much to establish the experimental method.

GALILEO GALILEI (1564–1642). Italian. Investigated and established the laws of falling bodies, projectile motion, elastic behavior of solids, gas and liquid pressure, sound, and thermometry. Applied optical instruments to astronomy; stimulated studies on celestial mechanics.

CHRISTIAN HUYGENS (1629–1695). Dutch. Enunciated the wave theory of light. Carried out experimental work of fundamental importance in mechanics and optics. Measurement of time.

ISAAC NEWTON (1642–1727). English. Established the laws of motion and gravitational attraction, and is to be credited with a new conception of the universe which is essentially that which prevails at present. Founded the infinitesimal calculus. Wrote "Philosophiae Naturalis Principia Mathematica." Contributed also to optics, acoustics, and various branches of mechanics.

BENJAMIN THOMPSON, Count Rumford (1753–1814). American-born cosmopolite. Physicist, engineer, philanthropist, and social worker. Contributed to knowledge of heat and light, demonstrated conversion of work into heat, invented useful household devices, founded the Royal Institution of Great Britain which has played an important part in the rapid development of modern science.

ANDRÉ MARIE AMPÈRE (1775–1836). French. Pioneer experimenter and interpreter of electrodynamics phenomena, of magnetic fields, and of the behavior of magnetic materials.

AUGUSTIN FRESNEL (1788–1827). French. Engineer, mathematician, and physicist. His work on interference, polarization, double refraction and diffraction of light established the wave theory and laid the foundations of physical optics.

MICHAEL FARADAY (1791–1867). English. One of the greatest of experimentalists. Discovered electromagnetic induction, laws of electrolysis, benzene, diamagnetism, and so on. Experimented with the passivity of iron, stainless steel, borosilicate glass. Many contributions to physics and chemistry.

HERMANN VON HELMHOLTZ (1821–1894). German. Anatomist, physiologist, and physicist. Clear thinker and great teacher. Founded the modern study of physiological optics. Developed analytic methods in hydrodynamics, thermodynamics, and acoustics.

JAMES CLERK MAXWELL (1831–1879). Scotch. Gave mathematical form to electrodynamic theory; certain of his conclusions, demonstrated experimentally by Hertz, are the basis of communication by electromagnetic waves. Made mathematical interpretation of the behavior of elastic solids, of Faraday lines of force, of the stability of Saturn's rings, of color, and of the kinetic theory of gases.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Registration

NEITHER the European crisis, national economic conditions, the great hurricane, nor an increase in tuition to $600 discouraged registration at the Institute, which on September 28 had a total enrollment of 3,064, an increase of 116 over last year. Applications for entrance far exceeded the freshman quota, and this year's entering class of 666, which is 54 more than last year, is an unusually fine-looking group. Registration in the Graduate School was 656, an increase of five over last year.

Chemical engineering, totaling 521 students, is the Institute's largest department, with electrical engineering, mustering 443, in second place. Mechanical engineering, with 415, holds third place, while business and engineering administration occupies fourth with a total enrollment of 264. Other departments rank in the following order: aeronautical engineering and meteorology, 233; chemistry, 200; physics, 156, a gain of 20 students over 1937.

While classification of students geographically has not yet been completed, indications are that this year's class represents wider distribution than last year's.

Professor Pearson's Retirement

WHEN the Institute's fall term opened, there was missing one man who had greeted 46 such openings before and had grown to be one of the best-known and beloved figures at Technology. The missing face was Henry Greenleaf Pearson, for 19 years, ending in June, Head of the Department of English and History and since last June, Professor Emeritus and Honorary Lecturer.

Professor Pearson holds among the Alumni of the Institute a position that is unique, for a great many Technology men claim membership in a well-knit organization — the Pearson alumni. Few instructors have been so closely connected as he has been with the kind of undergraduate interests that inevitably become alumni interests. Since his early days in the Department to his more recent participation in organizations for the enrichment of student life, he has been the sort of professor whose Christmas mail includes cards from Alumni all over the world — and he remembers the people who send the cards from '93 to '38.

The Department which he headed is truly the lengthened shadow of himself, for Professor Pearson has brought together all of the present staff. It is a tribute to his liberalism, his sense of proportion, and his sympathetic understanding that this Department today represents all points of view, diverse personalities, various races and creeds. Constantly aware of the dangers of academic provincialism, he has gone to Dartmouth, Hamilton, Chicago, Princeton, Bowdoin, Amherst, Cincinnati, Brown, Colby, Rochester, and many other colleges besides his own Harvard and his adopted Technology for instructors. To them he was "The Chief"; over them he kept a sense of the job they were to do and of their place in the Institute. That the Department has been so active in various fields of Institute life is a consequence of The Chief's ability to see the potentialities of his instructors as individuals rather than as scholarly specialists or bearers of imposing degrees.

Constantly alert and ever receptive himself, he kept his Department, too, forever aware of new ways of doing things, of new things to do and to use. He did not expect his suggestions, all or even many, to be followed, for never was a man more tolerant of the ideas and ways of others; but he did expect, from discussion of his suggestions, reconsideration of what was being done and confirmation that his men had the courage of their own convictions. His essential determination was that students should have the best, should have access to whatever would assist in giving them broadness, thoroughness, wealth of acquaintance, and knowledge. To this end he worked hard and expected his men to do likewise.

Officers of student organizations also drew freely on his time and energy, and many a diplomatic problem, too knotty for solution by youth unaided, was discussed and wisely solved at a luncheon table over which Professor Pearson presided as friend and host. And for a decade at least it was his enthusiasm that inspired the late Walker Club, a famous Tech society, in which students and members of the various faculties met on the pleasant ground of common cultural interests.

Typical of comment from his colleagues is this tribute written for The Review by Professor Robert E. Rogers: "For over 20 years I have worked for Henry Greenleaf Pearson. I was a kid instructor when I came here in 1913. For my first year I 'sat' under Arlo Bates, that perfect example of the old-school Bostonian that Howells and Barrett Wendell wrote about. Arlo Bates left the Institute one year before we crossed the river. Harry Pearson carried on, and has been with us until he became ill and had to give up teaching in February of this year. This fall he did not return.

"I suppose that when he first came here in 1893 the boys called him 'Molly' because of his slenderness, his light, clear voice, the appearance which shows in his early photographs of a youthful and rather wide-eyed simplicity of spirit. In all essentials I do not think he ever lost that appearance. Only the old nickname, which the more recent boys know nothing about, became a symbol of affection and friendliness and intimacy.

"Although he began his lifework as a teacher of English by writing a little tome on composition, he has never been particularly interested in the minutiae of

scholarship. By avocation he was a biographer, member of the Massachusetts Historical Society, and the number of biographies to his credit exhibit his care and thoroughness in research, his intimate knowledge of the background of Boston — see particularly the life of James Storrow — and his human understanding and sympathetic appreciation of the problems that faced his subjects.

"His last book was one of particular interest to Technology men — the life story of Richard Cockburn Maclaurin, who died in 1920. It was particularly a labor of love as well as the work of a trained research man. Personal friendship, great admiration, and the ability to thread his way through the complexities of those difficult days when people were arguing for and against the 'merger' and the 'new site' make the central chapters surprisingly clear and readable. It need fear no comparison with Sedgwick's life of William Barton Rogers or Munroe's book on Francis Amasa Walker.

"Pearson was always having boys out to his house on Dudley Road, Newton. He loved music and was enthusiastic about the 'words and music' of Gilbert and Sullivan, whom he enjoyed introducing to the boys of the younger generation. In the Walker Club and other organizations he never missed an opportunity to bridge the traditional gap between the undergraduate and the Faculty.

"In over 20 years I have never seen him lose his temper, exhibit favoritism, or crack down on an offender. His methods were democratic. He ruled his Department not with a rod of iron but on the democratic system of consulting everyone, listening to everyone, and seeking honestly to reconcile divergent points of view. I think he was one of the first in the Institute to stay his instructors with flagons and comfort them with apples — in other words with coffee and crackers at staff meetings. And his staff meetings were invariably amusing and extraordinary give-and-takes between young men, so different from the days when Arlo Bates dismissed departmental business by ukase amid a group of very silent young men. That is why I remember Pearson's long term of office with a pleasure and a real affection and respect."

PROFESSOR HENRY G. PEARSON

. . . who has retired after 19 years as head of the Department of English and History and after 46 years' total service at the Institute

From the Counting Room

IN his annual report to the Corporation last month, Treasurer Horace S. Ford emphasized the following facts about last year's financial operation of the Institute:

Of the $1,505,000 received from students, $1,452,000 was from tuition fees. Of this latter, $1,171,000 (82 per cent) came in cash, $83,000 (five per cent) through undergraduate scholarships and awards, $94,000 (six per cent) through graduate scholarships and awards, and $104,000 (seven per cent) through loans from the Technology Loan Fund.

The total of scholarships and awards was in excess of 20 per cent of the tuition for the regular year (excluding the Summer Session).

The book value of the endowment funds was $35,617,000, a net increase of $891,000 over last year. Capital gifts increased the fund $2,134,200, largely the Hayden ('90) bequest and the Cabot ('81) gift, but withdrawals from the Eastman Building Fund and from other funds for the various new building construction, renovations, and other projects were in excess of $1,100,000.

Through some year-end curtailment of expenses, it was possible to finish the year without dipping but $28,000 into the one-year-old Income Equalization Reserve Fund of $88,000. Thus did this Equalization Fund show its worth and, together with the profit of $9,000 carried from previous years' operations, enable the Institute for the fiscal year closed in June to carry over an operating surplus of $1,359.03.

The budget estimate of income from investments applicable to operations for current purposes was set up for the year at $1,300,000. In spite of sharp dividend reductions during the last half of the year, the total reached $1,284,000. This enabled the Institute to allocate 4.55 per cent to all the funds participating in the general investments as against five per cent last year and 4.67 per cent in the year before. The yield on all the Institute's investments based on their market value as of June 30 was 4.45 per cent, slightly lower than last year.

Faculty Appointments

THE appointment of Harold L. Hazen, '24, as head of the Department of Electrical Engineering and three important additions to the staff marked the opening of the academic year. Professor Hazen succeeds Professor Edward L. Moreland, '07, whose appointment as dean of engineering was announced in June. The three new members of the staff are C. Richard Soderberg, '20, who has become a professor in the Department of Mechanical Engineering, and Conrad M. Arensberg and Dwight L. Palmer, who have joined the staff of the Department of Economics and Social Science.

Professor Hazen brings to his new administrative post broad experience in teaching and research. Following his graduation, he was engaged for two years in industrial research, returning to the Institute in 1926 to teach and carry on graduate work. He was awarded his master's degree in 1929 and the doctorate in science two years later. His appointment as associate professor came in 1936, and as head of his Department he is now advanced to the rank of full professor.

Professor Hazen has coöperated in the design and construction of several important electrical devices, among them the network analyzer, upon which power systems are simulated for the solution of electrical engineering problems. He was also associated with the development of the differential analyzer, designed under the direction of Dr. Vannevar Bush, and for the past year he has been in charge of graduate study and research in electrical engineering. His teaching has been primarily in the power field, including instruction in electrical circuits, machinery, transmission, and advanced work relating to power systems. In 1935 Professor Hazen was awarded the Levy Gold Medal of the Franklin Institute for outstanding technical papers presented in that institute's journal on the theory and design of servo-mechanisms, devices for controlling the action of other machines. During 1934–1935 Professor Hazen served as an exchange professor at Ohio State University.

Professor Soderberg is widely known as an authority in the field of applied mechanics, in which he will specialize at the Institute. Before coming to Technology he was manager of the turbine division of the Westinghouse Electric and Manufacturing Company. A native of Sweden, Professor Soderberg has had wide experience, both in this country and abroad, in the general mechanical and electrical problems of large power machinery. He was educated in the Technical Gymnasium in Härnösand, Sweden, graduating in 1914, and five years later he was graduated as a naval architect from the Chalmers Institute of Technology in Göteborg, Sweden. He came to the United States in 1919 on a fellowship from the Scandinavian-American Foundation and spent a year in advanced study of naval architecture at the Institute, receiving a bachelor's degree.

After a year on the technical staff of the New York Shipbuilding Corporation, he joined the heavy traction railway department of the Westinghouse Company and in 1924 was transferred to the power engineering department, where he specialized on problems of large turbine generators. Later, Professor Soderberg returned to Sweden for two years to undertake development of large turbine generators for the Swedish General Electric Company. He returned to the Westinghouse Company in 1930, and from 1933 until his appointment at the Institute, he was in charge of the turbine division.

Dr. Arensberg has been appointed assistant professor of social anthropology and will offer courses in the field of sociology. His principal activities, however, will be in connection with the research program of the new Industrial Relations Section. He is a graduate of Harvard University in anthropology, where he received the bachelor of arts degree *summa cum laude* in 1931 and the doctorate of philosophy in 1934. His special interests are in the study of the modern community and industrial organization. In 1931 he was awarded a Sheldon Travelling Fellowship, and in 1934 he was granted a Harvard Junior Fellowship, which he has held continuously since that time. In 1936 he delivered a series of lectures for the Lowell Institute, later publishing these talks in a book entitled "The Irish Countryman."

Dr. Palmer has been appointed instructor in sociology. In addition to teaching in the field of sociology, he will be an active participant in the research work of the Industrial Relations Section. Dr. Palmer received the bachelor of arts degree from Pomona College in 1925, the master of arts degree from the University of Chicago in 1926, and the degree of doctor of philosophy from Stanford in 1935. He has held teaching posts at Beloit College and Stanford and in 1932 was employed as economist with the California State Unemployment Commission. He has spent the last three years in England on a Social Science Research Council Fellowship, pursuing study and research in the field of industrial relations.

Conferences and Courses

SCIENTIFIC and engineering conferences and specialized industrial courses have notably increased the scope and variety of the Institute's summer program

M.I.T. Photos

IN THE
WILLIAM BARTON ROGERS
BUILDING

To the left are shown the library and exhibition room of the School of Architecture, and below, a view of the rotunda of the new building.

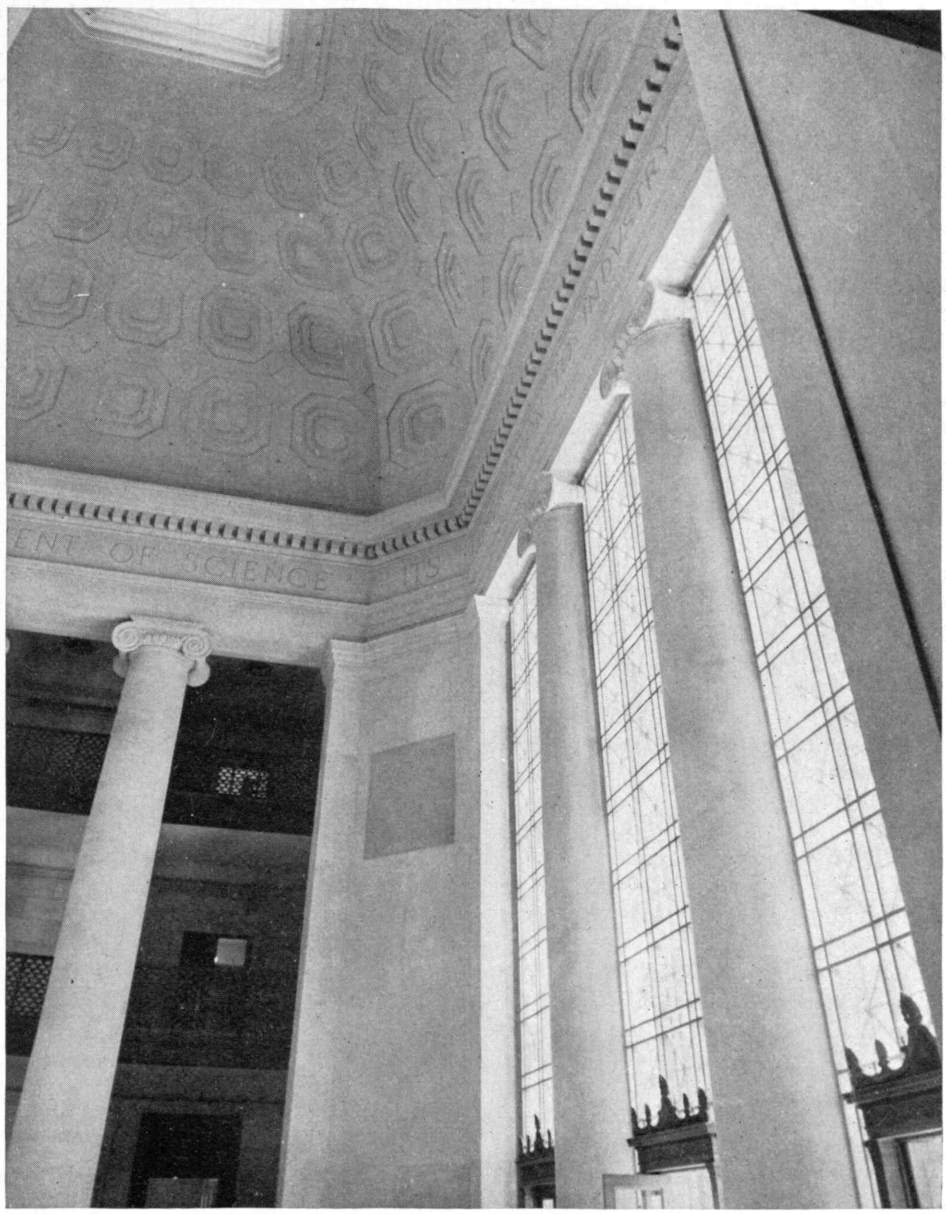
The architectural library is beautifully appointed and equipped, and some of the special equipment used for storing the School's thousands of slides, for the filing of magazines, and for the shelving of large books may be seen in the picture reproduced

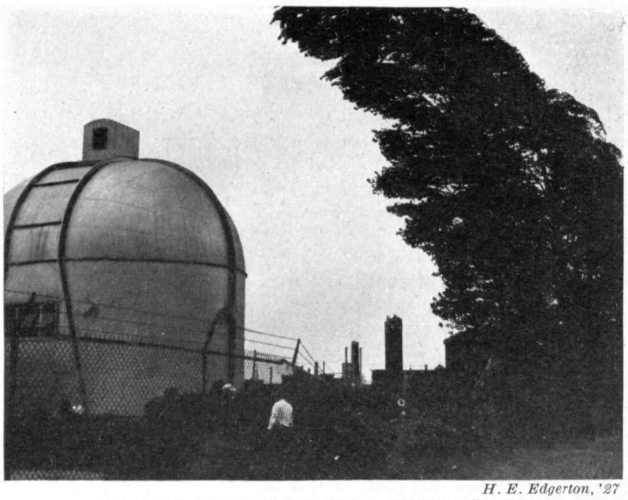
in recent years. The past very warm summer proved no discouragement to attendance at no less than four important conferences or to enrollment in 12 courses designed for graduate engineers, executives, and city planners desiring to be brought up to date on advancing knowledge and the newer techniques of their several professions. These conferences and courses attracted more than 600 engineers and industrialists from all parts of the United States, Canada, and abroad.

In addition to conference and special-course students, enrollment in the regular Summer Session program reached a total of 1,416, an increase of 7.3 per cent over last year, while candidates for entrance examinations, a total of 142, increased 4.4 per cent.

The spectroscopy program, sponsored by the Department of Physics for the sixth year, attracted an attendance of 56 in the courses and an attendance of 233 from 25 states, as well as Canada and Scotland, at the three-day conference held under the direction of Professor George R. Harrison.

Two courses in ceramics were offered by the Department of Metallurgy, the first





H. E. Edgerton, '27

IN THE MIDST OF THE HURRICANE

With the housing of the Van de Graaff generator stolidly standing, while poplar trees toppled over on Vassar Street. Except for trees, the damage about the Institute was slight

on the nature of glass and the second on reactions in ceramic materials on heating. Both were well attended by representatives of the research laboratories of the glass and clay working industries, as well as by several members of the faculties of other ceramic schools.

The Department of Mechanical Engineering sponsored a conference on timber and concrete which provoked interesting discussion of these important materials among a group representing the fields of manufacture and utilization. The advanced courses in theoretical and applied colloid chemistry, given for the third consecutive year, drew capacity attendance. The enrollment showed a notable increase in the number of teachers who are preparing for instruction in the subject.

A joint summer program arranged by the School of Architecture and the American Planning and Civic Association included three courses and a conference which, in addition to interested individuals, drew representation from six planning agencies and educational institutions. The courses included principles of planning, planning techniques, and planning administration.

Registration for the course in textile analysis, covering a period of six weeks, exceeded all previous enrollments, many students coming from the Middle West and West.

Two summer conferences in biology, offered for the first time, drew several students, and the prospects are that attendance at this important program will be considerably larger if the course is offered next year. The Department of Mathematics and the Department of Economics and Social Science this year held, also for the first time, a very successful two-day conference on engineering and industrial statistics. The discussion centered about the application of statistical methods to mass production and quality control. The conference drew an attendance of 127 from this country and abroad.

Through the Summer

THE turmoil and the din (and what a din!) of the riveting gun and the peen hammer, the stonecutter's mallet, and of hammer and saw died away with the end of summer after the most active period of building since the Institute moved to Cambridge in 1916. The tangible effect of it all is the new Rogers Building — the impressive new wing of the Institute occupied by the School of Architecture, as well as by various laboratories and classrooms; the Wright Brothers Wind Tunnel; the new Graduate House, formerly Riverbank Court Hotel, now remodeled and refurbished; and the new track for Technology's runners. Meantime the installation of the electrostatic generator in its new steel-domed laboratory has been completed, and foundations are being prepared for the cyclotron, plans for which were announced in the July Review.

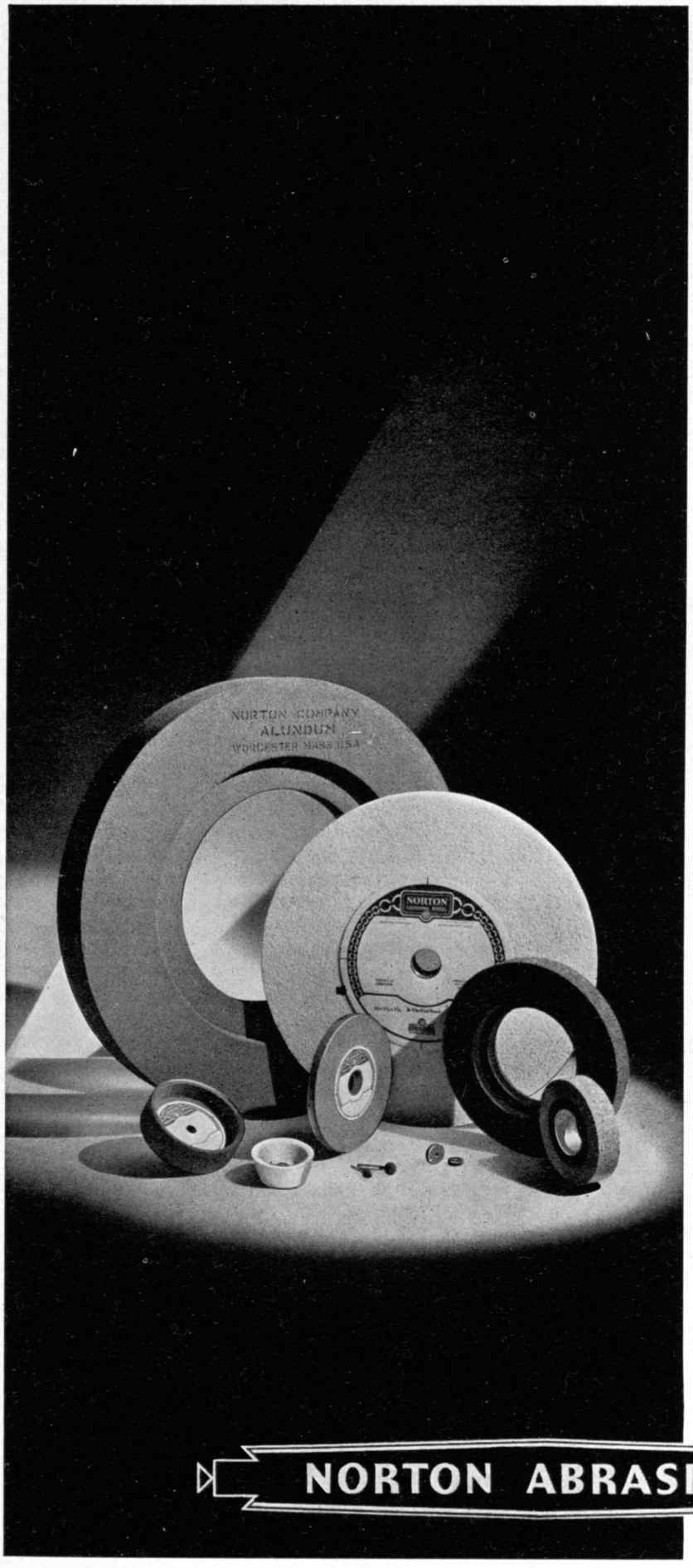
The new Rogers Building was occupied by the School of Architecture while painters still plied their brushes, and by opening day of school, students were entering the building through the great vestibule (see page 31). Notable features of the building are the exhibition and drafting rooms, all exceptionally well lighted, a comfortable Commons Room for students of the School, and the very efficient and pleasant arrangement of our splendid architectural library.

Dedication of the Wright Brothers Wind Tunnel was an event of great interest to members of the International Congress for Applied Mechanics on September 12. Godfrey L. Cabot, '81, life member of the Corporation, presided at the dedication ceremony at which Griffith Brewer of the Royal Aeronautical Society of Great Britain and barrister for the Wright brothers in securing the British patents on their original airplane, spoke on their contribution to aeronautical science. George W. Lewis of the National Advisory Committee for Aeronautics made an address (published on page 24) on the value of the wind tunnel in aeronautical design and research, and President Compton closed the ceremony with a brief address.

Sloan Fellowships

FIVE young executives, chosen for their high intellectual capacity, administrative promise, and interest in the social and civic implications of industry are now studying at the Institute under fellowships established by a grant of $15,000 from the Alfred P. Sloan Foundation of New York. These fellowships represent one phase of the foundation's endeavor to promote the increase and diffusion of economic knowledge through education for leadership.

The successful candidates won the fellowships in a competition among 164 young executives nominated by their employers in all parts of the country. The winners, who began their work in June, are: M. Wren Gabel, assistant to the production manager of the Eastman Kodak Company, Rochester, N. Y.; Elliott M. Gordon, production engineer and assistant to the vice-president of Griggs, Cooper and Company, St. Paul, Minn.; Walter K. Graham, head of the annealing department of the Tennessee Coal, Iron and Railroad Company, Birmingham, Ala.; Wayne J. Holman, Jr., assistant district manager of the Central Hudson Gas and Electric Company, Newburgh, N. Y.; and E. Scott Pattison, member of the executive staff of G. M. Basford Company, Inc., of New York City.



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The committee which had the difficult task of choosing five fellows from a group of 164 was composed of Vannevar Bush, '16, Vice-President of Technology; Edmund C. Mayo, President of the Gorham Manufacturing Company; Harry M. Goodwin, '90, Dean of the M.I.T. Graduate School; Ralph E. Freeman, Head of the Department of Economics and Social Science; and Wyman P. Fiske, Associate Professor in the Department of Business and Engineering Administration. The recipients of the fellowships began their work on June 14 and will spend a year in the Departments of Business and Engineering Administration and Economics and Social Science in a program of education for industrial leadership which expands the concept of managerial functions to include not only executive skill but an understanding of the social implications of industrial responsibility.

Visiting Committee Reports

AS our regular readers know, The Review publishes from month to month condensations of the reports presented to the Institute's Corporation by the various Departmental Visiting Committees. Obviously, space will not permit us to publish each and every report, but we try to single out those which contain recommendations or information likely to interest a wide group of readers. This month we have chosen the following reports, presented to the Corporation at the end of the last academic year, as coming within that category; other reports will follow in succeeding issues.

DEPARTMENT OF GEOLOGY*

THE current enrollment of 12 undergraduates and 22 graduate students in the Department represents a material increase over previous years, and there seems to be every indication that the growth will continue. The enrollment of 22 graduate students last year was the largest in the history of the Department and was made up of an unusually high type of men of outstanding ability.

An analysis of undergraduate teaching in the Department revealed the fact that 46 per cent of the instruction was devoted to students enrolled in the Department, while 54 per cent was service instruction to students in other courses, principally civil and mining engineering.

The staff was increased at the beginning of the last academic year by the addition of two new members with the rank of assistant professor.

In the direction of research the Department has been active in producing important contributions to fundamental problems in geology, mineralogy, and geophysics. The facilities of the Department have been improved, although due to the increased enrollment of graduate students a real need exists for additional petrographic microscopes. The Committee anticipates that space requirements will be taken care of satisfactorily this year.

* Members of this Committee for 1937–1938 were Louis S. Cates, '02, Chairman, James M. Barker, '07, Norman L. Bowen, '12, Robert B. Sosman, '04, Walter C. Mendenhall, Gordon S. Rentschler, and F. Ward Paine.

After reviewing the status of the Department, the Committee devoted considerable time to a discussion of the proposed course of study in mineral resources which recently was set up by the Department following the decision of the Administration of the Institute to discontinue the curriculum in mining engineering.

In considering possible developments for the future, emphasis was placed on the fact that the Department had a unique opportunity for offering a very high type of training in the geological aspects of engineering. The Committee agreed that the Department was under a real responsibility to provide instruction of this kind, in addition to a training of superior quality in professional geology. It was felt that the Department was fully aware of this need and that appropriate steps were being taken towards its early fulfillment.

NAVAL ARCHITECTURE AND MARINE ENGINEERING*

THE Committee reported that the Course is carrying as many students as the present staff can adequately instruct and that the course in ship operation (XIII-C) is carrying as many students as Professor Chapman, '10, feels that the industry will absorb at the present rate of operation. The 10-day general professional examination which is required in Course XIII-A for a degree was the subject for favorable comment as an excellent method of finally determining the student's fitness and the benefits which he has received from his courses. During the past academic year there were 21 United States Navy students, five Argentine Navy students, and one Coast Guard student in this option.

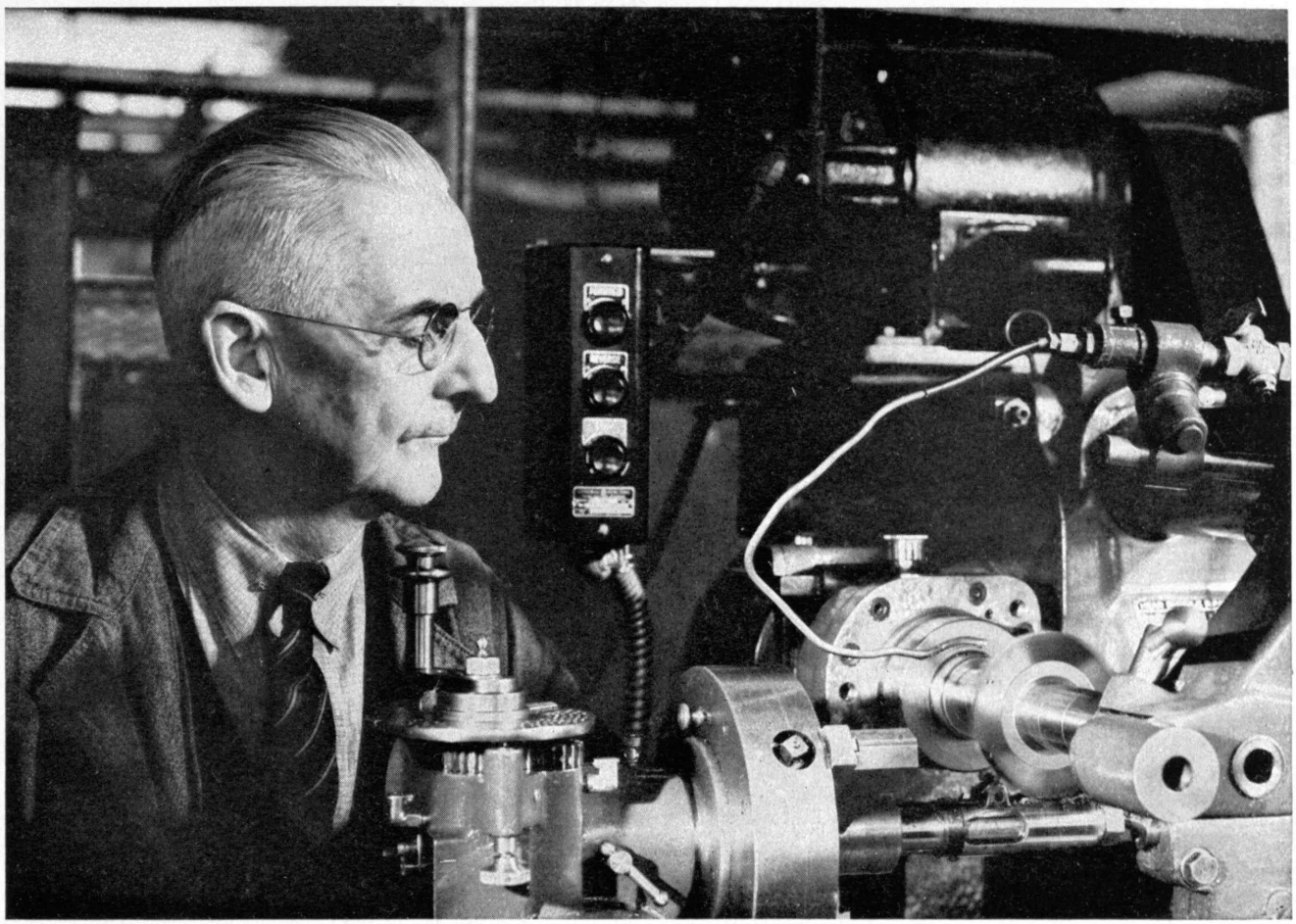
Designs for a towing tank for models are still under consideration, and two proposals are before the Committee: (1) the possibility of using a short tank with very high acceleration of the model and (2) a stationary model with moving water stream. The propeller testing tunnel has been installed. Professor Lewis is calibrating it and adjusting it for accurate operation.

A graduate year in marine engineering leading to the master's degree in marine engineering is available at the Institute. Students in this Course are allowed to select their subjects for specialization in a wide field of study. The Committee considered the advisability of establishing a scholarship for students taking this graduate year—the scholarship to include living expenses.

The Committee noted the improvement of the Nautical Museum and its increasing interest to visitors and suggested that some of the corridors in the Department might be used for further exhibits.

Other items emphasized in the report: The course in merchant shipbuilding for naval officers studying at the Institute; the book on naval architecture which is being published by the Society of Naval Architects and Marine Engineers under the editorship of Commander Rossell, '15, and Professor Chapman; the remarkable growth of small-boat sailing at the Institute; improvements in the quality of entering classes at the Institute as a result of the selective admission system.

* Members of this Committee for 1937–1938 were Joseph W. Powell, Chairman, William R. Hedge, '96, Charles Francis Adams, Gordon G. Holbrook, '10, William S. Newell, '99, Rear Admiral George H. Rock, and Commander Claude O. Kell, '20.



AMERICA'S ANSWER

ALL over the world, nations are struggling to obtain a higher standard of living for their people. They are resorting to conquests, boycotts, experimental forms of government. But America has its own answer to this problem—a solution which has proved its worth. This American workman and millions of his associates, aided by the scientists and engineers of industry, are raising the living standards of all of us. They are doing it by constantly developing new and better products, and then learning to make them inexpensive so that millions of people can afford them.

For instance in 1927, when an electric refrigerator cost about $350, approximately 375,000 were purchased. In 1937, a better refrigerator cost only $170. And because the cost had been cut in half, *more than six times as many people* bought them.

In the same ten years the cost of a typical electric washer has been reduced from $142 to $72, a console radio from $125 to $53, and a 60-watt MAZDA lamp from 30 to 15 cents. And these new lower-cost articles, typical of hundreds of manufactured products, perform better and cost less to operate than their predecessors.

General Electric scientists, engineers, and workmen, by contributing to this progress—by helping to create more goods for more people at less cost—are hastening the day when all may enjoy the comforts and conveniences which only the rich could afford a few years ago.

G-E research and engineering have saved the public from ten to one hundred dollars for every dollar they have earned for General Electric

GENERAL ELECTRIC

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1938—OUR SIXTIETH YEAR OF ELECTRICAL PROGRESS—1938

FROM SHELLAC TO SYMPHONY

(*Continued from page 20*)

cones showed quirks of their own, such as rattling at the higher frequencies or failing entirely to produce low tones, but by introducing baffles and resorting to various tricks which became obvious when careful measurements of their sound production were made, most of these quirks were eventually removed.

Many fine modern reproducers contain three or more loud-speakers. One large speaker, picturesquely called a "woofer," responds to the low tones, and for the high tones two smaller speakers called "tweeters" are used, inclined at a slight angle to each other. This angle is needed because, while low-pitched sounds spread out in all directions, high-pitched sounds tend to radiate from the speaker in a direct beam. A listener who is sitting to one side of the speaker may then hear the low tones proportionately louder than the high, unless some means is taken to offset this. The effect can be noted in outdoor bandstands in which a curved sounding board is used to throw the sound into the audience. Those sitting in front of the stand may get a well-balanced sound mass, while to a listener sitting far around on the side may come only the oompah-oom of the bass tuba and the thud of the big bass drum. One listener from the sidelines at such a concert reported that he had recognized only one tune, "The Star-Spangled Banner," and his recognition of this was visual rather than auditory!

To study the response of their apparatus to sounds of all pitches, from the highest treble to the lowest bass, physicists use instruments which count the number of vibrations striking the ear or the microphone each second. These instruments show that to reproduce all kinds of music perfectly a phonograph should respond faithfully to vibration rates between 30 per second and 15,000 per second. Fidelity must extend from the 30 vibrations a second reached by the bass tuba, the bass viol, and the kettledrum, to the 15,000 vibrations a second required for high harmonics of the snare drum, the violin, and the cymbals. To vibrate a piece of steel back and forth 15,000 times a second demands much energy. Unless the engineers are ever on the alert, an acoustic device will respond half-heartedly or not at all to the very high tones and the very low tones. Such distortion, even when of a degree not sufficient to affect the clarity of speech, interferes subtly with the enjoyment of music, even though it may be difficult for a listener to be sure that something is wrong.

Since all modern radio receivers contain a vacuum tube amplifier which is especially designed to amplify the electrical wavy line, and a loud-speaker to change this into sound waves, all that is required to produce a modern electrical phonograph with such a set is to add a turntable with which to spin records, and a needle holder and pickup device to transform the mechanical wavy line into electrical form. The phonograph and the radio have thus gone into a partnership which resulted in advantage to both.

Even when a distortionless, scratch-free melody comes from a sound reproducer, it will not sound entirely natural until two requirements are fulfilled. First, a record should be played at the same loudness level at which it was recorded, for the human ear has a peculiarity which makes some tones sound higher as they are made louder, and others lower. If a selection be only one-tenth as loud when reproduced as when originally played, the distortion in the listener's ear can be very marked. Good recordings can seldom be played at the proper volume without disturbing the neighbors, but if this can be done, it usually results in greatly improved quality.

The second requirement is that two sound channels be provided, so that our two ears will hear slightly different sounds, as they would have in the room in which the sound was originally produced. This point is well illustrated by Oscar, a tailor's wax dummy with microphone ears which is held in much affection in the Bell Laboratories. If a listener holds to his right ear a receiver connected to Oscar's right microphone, and to his left ear another receiver which goes to Oscar's left microphone, then closes his eyes and listens, he feels that his head is actually inside Oscar's, whether they be separated by ten feet or a thousand miles. For all practical purposes Oscar's microphones are the listener's ears, and whatever happens near them sounds as though it were happening near the listener. It is strikingly true that not only is two-ear hearing necessary to give one an idea of where a sound originates, but it is also absolutely essential if the sound is to have accurate quality and naturalness. Take one receiver from an ear, and Oscar's weird power vanishes. To accomplish such a result with a phonograph would require two synchronized sound tracks, or records, and two speakers, which at present seems too complicated to be desirable. But the possibilities of such three-dimensional, or stereophonic, recording should not be overlooked.

WILL records stored on film, requiring no needle for playing, ever supplant disk records for home phonograph use? A hundred narrow ultraviolet-recorded sound tracks could be put side by side on a single film, and thus 20 hours of playing time — all the symphonies of a great composer — could be stored in a single standard film a thousand feet long. Or a whole library of popular songs could be carried by one long-playing record. But films are much more fragile than disks and are less convenient to handle, while the difficulty of turning at will to any part of such a musical library would limit its advantages, and the necessity of providing separate selections to suit individual tastes must also be considered. Musical libraries on film may have special uses, however, and we must not overlook the possibility of arranging to turn to any desired section of a film by pressing buttons on a keyboard. Instead of being owned and kept at home, such wholesale records might be kept in central studios from which they could automatically be played, music from them being transmitted over special telephone lines. A subscriber who felt in the mood for the "Sextette" from "Lucia" need then only dial DONizetti 6–641 on his special line to have this selection piped electrically to his high-fidelity reproducer.

Often pseudoscientific stories are current about remarkable devices supposed to (*Continued on page 38*)

FROM SHELLAC TO SYMPHONY

(Continued from page 36)

have been purchased from their inventors and then buried by powerful interests who feared the loss of rich incomes from their own inferior equipment if the world were allowed to profit by the new inventions. A phenomenal magnetic phonograph, said to require no needles and to give perfect reproduction with records which do not deteriorate with use, is the subject of one such story. A well-known writer has publicly implied that this invention should have made obsolete all present phonographs and dictating machines and infers that by neglecting it American scientific initiative has betrayed the public interest. Has the "phonograph trust" suppressed a perfect phonograph for fear it would stop the profitable sale of disk records?

As with most such stories, plausibility is lent by a grain of truth on which entirely erroneous conclusions have been founded. The remarkable magnetic phonograph turns out to be nothing but the telegraphone, long used for taking dictation and for the self-answering telephone. Storing a sound pattern in the form of magnetic wiggles in a long steel wire has been perfectly feasible since Professor V. Poulsen of Copenhagen first suggested and tried it in 1903. No needle is required, for the magnetic forces stored in the wire induce in a coil electric currents which reproduce the stored sound. The record can be erased simply by drawing the wire past a powerful magnet, when the steel will be ready to be filled again with sound.

Here the advantages of magnetic recording end, and limitations to its usefulness begin to appear. Though such a record is permanent — and a wire has been made to disgorge a load of understandable speech even after carrying it for 30 years — it must be kept away from thunderstorms or electric motors which produce stray magnetic fields. Research through the years has improved the quality of its reproduction, but this is still not superior to that of mechanical or optical recording when the length of wire in a record is kept within reason, for, as with the other methods, the short waves which store the high-pitched components of sound tend to blur together if packed too closely. Again, a wire or ribbon hundreds of feet long is less convenient to handle than a simple disk record which keeps its sound track carefully coiled up in a neat spiral. But problems of copying set the most important limitation to magnetic recording. When we realize that nearly two million copies of a record may be sold, as in the case of such songs as "Ramona," "Blue Heaven," and "Prisoner's Song," the importance of simple methods of duplication, similar to printing, is obvious. Magnetic records can be copied only by playing them through and recording on other wires, each running through an individual recording machine. Such limitations prevent this type of recording from being considered seriously for the phonograph field.

That the same piece of steel wire can be used thousands of times for magnetic recording, and hence would be the cheapest known type of "temporary record" material, suggests its usefulness for office dictation. But here again a coil of wire is less *(Concluded on page 40)*

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(*Concluded from page 38*)

convenient than a cylinder for carrying dictation to a typist. Magnetic recording comes into its own only where a permanent installation can be made, and in radio broadcasting studios and in newspaper offices it is finding increasing use.

New types of sound track will doubtless be found practical as research makes new tools available. Reproduction of a sound track by printing on a paper tape has been carried out successfully in Europe. A phototube picks up the fluctuating light reflected from the tape and sends out a pulsating electric current in synchronism with the black waves inked on the white paper passing before it. If the sound track could be compressed to smaller size, the printing method might conceivably be used for producing optical disk records. An ideal solution of the phonograph problem would result, for no needle would be required, records would not wear due to playing, and duplication on printing presses should be so inexpensive that if we should want a daily morning record tomorrow, it should cost no more than the morning *Daily Record* of today.

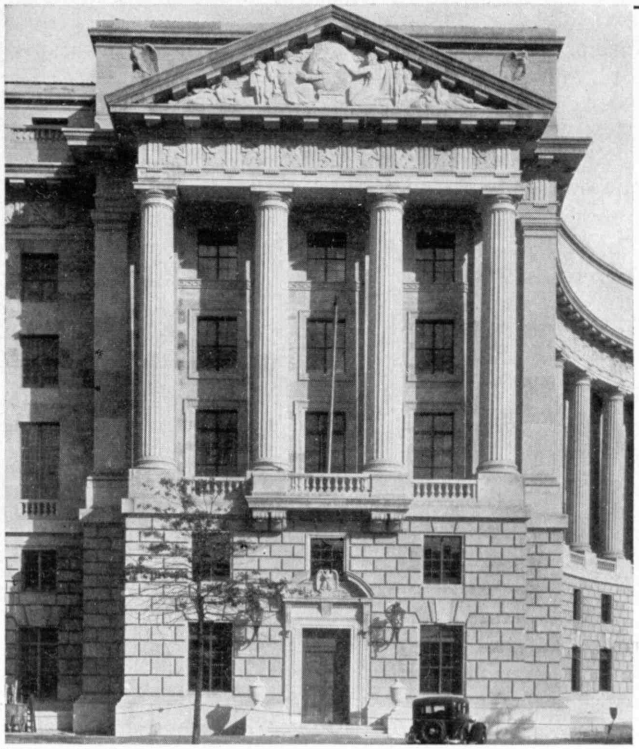
The storing and re-creation of sound is a scientific miracle, perfected by the research physicist when he learned to induce coöperation between inanimate dancing atoms and electrons. If science seems to be making the production of music more mechanical, it is with the purpose of making music less mechanical and more natural. If musical apparatus seems to be getting more complicated, it is so that production of music can be made simpler. If scientists are taking more trouble with sound production, it is so that listeners and performers can give less attention to irrelevant features of the musical art and more attention to its important features. From all this is springing a new flowering of music which should delight the ears of the world.

MOLECULES IN YOUR CRANKCASE

(*Continued from page 22*)

doesn't spread when poured on water, while those containing certain radicals or groups of atoms, such as the hydroxyl (OH) or carboxyl (COOH) groups, in addition to the carbon and hydrogen atoms, will spread out on water with great facility and eventually form films as thin as one molecular diameter. To explain this behavior, such investigators as Langmuir in this country and Adam and Rideal in England developed a concept of the nature of organic molecules which has been particularly applicable to the study of thin-film lubrication.

This concept depicts such molecules not as spheres but as long, flexible chains which, because of their form and behavior, might be compared to certain members of the insect world. Pure hydrocarbon molecules might be likened to earthworms, for they are relatively sluggish and inert, consisting almost entirely of long bodies with no readily discernible heads. The hydrocarbon "body" consists of carbon and hydrogen atoms so linked that all the internal forces are satisfied, and molecules of this type, being self-sufficient, have no affinity for water (or any other substances) and (*Continued on page 42*)



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MOLECULES IN YOUR CRANKCASE

(*Continued from page 40*)

hence have no desire to spread. The molecules with the active groups at the end, however, are more like leeches, the groups resembling the heads and the long hydrocarbon chains resembling the bodies. Just as leeches will fasten their heads by suction to surfaces (human skin, for example) which attract them, so do the heads of molecules of this type attach themselves to the surfaces of substances for which they have an affinity. Thus, those substances which spread on water do so because the groups at their heads are attracted more by the water molecules than by those of their own kind. Each molecule not already in contact with the water migrates until it has reached the nearest unoccupied bit of water surface to which its head can cling. The spreading continues until either the available water is all taken possession of or every molecule has found a place on the surface. In the latter case the monomolecular film on the water can be visualized as an aggregation of long, closely packed creatures all standing vertically on heads which have clamped themselves firmly to the water. The mere presence of an active group at the end of a molecule does not imply that it will necessarily be attracted to water, for some such groups are actually repelled by water, although attracted by other substances.

Many organic molecules seem to have a strong affinity for metals, since these molecules will spread out and attach themselves with great tenacity to metallic surfaces, forming monomolecular films that are hard to rub off. Substances whose molecules exhibit such behavior are of obvious value as constituents of lubricating oils. When a liquid of this type is spread on a metal, the molecular layer next to the surface is perfectly oriented, the heads vigorously biting into the surface and the long tails projecting perpendicularly outward. Although the molecules in the second layer cannot get to the metallic surface, they are still attracted by it, and their heads press closely against the tails of their more fortunate neighbors in the first layer, so that they, too, are oriented in a direction perpendicular to the surface. Molecules in the next few layers generally tend to line up in much the same way, but the attraction of the metal for the molecules farther out wanes with distance, and these have little or no tendency to line up in any orderly fashion.

Such a picture readily explains why oils which contain molecules with heads that cling tightly to metallic surfaces give the least friction in a bearing under boundary conditions. When two smooth, polished surfaces of metal slide over one another with no lubricant in between, friction is caused by the unbalanced attractive forces from the metals which act across the interface. Actually, no polished surface is sufficiently smooth to allow so close an approach between the two surfaces that these forces can act over any considerable area. Only the minute elevations and projections cause friction by bridging on to the opposite surface, becoming welded to it, and breaking apart from it, all within the surprisingly short time of one ten-thousandth of a second. The purpose of any lubricant is to keep (*Continued on page 44*)

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(*Continued from page 42*)

the two surfaces far enough apart so that such contact cannot take place. In thick-film lubrication this is accomplished by simple mechanical separation of the surfaces beyond their effective fields of force. But in thin-film lubrication it is accomplished by the buffering action of the first few layers of strongly adhering oil molecules, where such are present in the lubricant. These actually neutralize the forces from the metals which would otherwise cause damage upon such close contact. For when each surface is so covered, the contact between the two moving parts is between the relatively inert portions of the molecular layers — the tails of our analogy — rather than between the metals themselves. The friction is therefore much diminished when the protuberances from one surface rub against the opposite one, and when the oil film adheres strongly to the metal.

Since no one has ever been able to see individual molecules as such, it would be entirely logical to ask just what the evidence really is for the picture just presented of the mechanism of boundary lubrication. Until quite recently the known evidence would have to have been more circumstantial than direct. But lately two powerful tools of modern physics have been applied through which we can come much closer to actually seeing molecules than we ever could before. Both of these have confirmed the essential features of the picture of boundary lubrication just outlined. The two tools are the x-ray and electron diffraction.

The x-ray has been used for a quarter of a century to determine with phenomenal accuracy the structure of crystalline substances in terms of the size and shape of the fundamental building stones of which each crystal is composed — the so-called unit cells. This method makes use of the fact that every crystal has the arrangement of its atoms in the unit cells repeated indefinitely in a regular three-dimensional lattice in somewhat the same way as the pattern on wallpaper repeats itself indefinitely in two dimensions. When an x-ray beam passes through the crystal, each atom deflects the part of the beam that strikes it, and because of the regular spacing of the atoms at the corners of the unit cells, the total effect of these deflections is observed as a pattern of discrete dots on a photographic plate. This is known as an x-ray diffraction pattern. From measurements of the positions of the dots, the size and shape of the unit cells can be calculated. For substances such as liquids, whose atoms have no regular orientation, the diffraction picture will consist only of a diffused halo without definite dots or lines.

When thin films of oil are investigated by the x-ray, the pattern that is obtained depends mainly upon the compositon of the sample studied. Those that contain active groups with oxygen or chlorine atoms in them give the dot pattern, corresponding to a regular regimentation of the molecules in layers. Films of pure hydrocarbons not containing such groups give the diffuse pattern, revealing the disorganization of the molecules which evidently point in all possible directions. For those molecules which (*Continued on page 46*)

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(*Continued from page 44*)

line themselves up in layers, the distance between the parallel rows of heads can be calculated from measurements upon the dots in the x-ray pattern. Clark, Lincoln, and Sterrett, of the University of Illinois, did this and found that each layer of a thin oil film spread on a metal is either as thick, or twice as thick, as the known length of the molecule of the substance that constitutes the film. Where the layer is twice as thick, it would appear to consist of two molecules lined up end to end.

Electron diffraction is the most recent and probably the most useful of the tools to be employed in the study of molecular arrangement in lubricants. Twelve years ago Davisson and Germer of the Bell Telephone Laboratories discovered that when a beam of high-speed electrons is shot at a smooth metallic surface, it is reflected not as discrete particles, such as lead shots would be, but as waves. That electrons could thus be shown to have the dual characteristics of matter and of waves was a striking confirmation of the theory, published by Louis de Broglie two years previously, that moving electrons are guided by waves with a characteristic length depending on the velocity of the electrons. Such electron waves, having the same range of wavelength as x-rays, are diffracted by matter in much the same way as x-rays, giving patterns of a corresponding sort. There is one significant difference between the two kinds of diffraction, and that is the fact that the electrons are not so penetrating as x-rays and can give information only about the surfaces of the substances against which they are shot. This apparent limitation makes electron diffraction particularly valuable for studying thin films of oil, and in the last few years this method has been extensively used for that purpose, especially in England.

In their investigation of wear and lubrication by electron diffraction, Finch and Zahoorbux showed that a monomolecular film of oil on a smooth metallic surface gives a sharp line pattern, corresponding to perfect orientation; a bimolecular film gives a diffuse line pattern, indicating only partial orientation; and a trimolecular film gives no pattern at all. Murison found that thick films of oil on copper give a blurred diffraction pattern, showing no molecular regimentation, but that if the film is made very thin, a sharp spot appears, indicating a regular arrangement of those molecules closest to the metal. Since the electron diffraction pattern indicates the state of things only in the molecular layer which the electron beam hits first, both experiments corroborate the tendency, previously noted, of the layers of the oil film farther from the metallic surface to show less orientation. Murison also found that heavy oils and greases give a straight line pattern with spots, suggesting that the molecules in the film are completely lined up. Since heavy oils and greases are known to give particularly low friction in bearings under boundary conditions, compared to other lubricants, this furnishes a confirmation of the hypothesis that the more complete the orientation of the oil molecules along the surface of the metal, the more satisfactory the lubrication under thin-film conditions. Such orientation indicates a strong attraction of the metal for the oil (*Concluded on page 48*)

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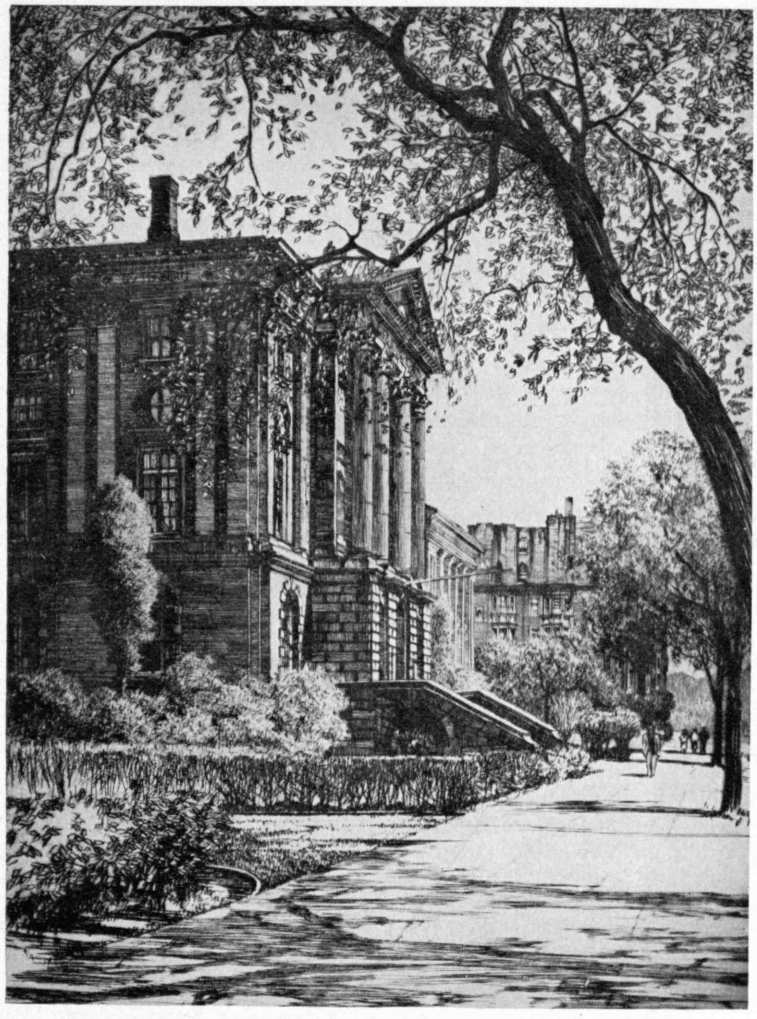
(Concluded from page 46)

molecule, a factor which would prevent the lubricant from being squeezed out from between the metallic surfaces.

Since the substances whose molecules cling to the metal are effective only within a few molecular diameters of it, there is no necessity for adding more than a very minute quantity of them to an oil to make the latter an efficient lubricant under boundary conditions. For as soon as the oil forms a film on a metallic surface, the molecules which have an affinity for the metal migrate to it and take possession of the space just around it, forcing out all the more inert molecules and lining up in rows to protect the metal from all intrusion. That these oiliness agents, as they are called, give a protection all out of proportion to their concentration in the lubricant is indicated by experiments in which the sliding friction between two metals has been reduced as much as 50 per cent by the addition of extremely small amounts of such compounds to the more inert mineral oil originally acting as lubricant.

It would thus appear that the esoteric and disconcerting property known as oiliness is rather directly concerned with the molecular attracting forces at the metallic surface and within the lubricant. Although these forces are so exceedingly complex that no complete quantitative theory of boundary lubrication is in sight, enough has been learned to establish a qualitative picture of considerable practical usefulness in the world of industry.



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WHY WIND TUNNELS?

(*Continued from page 24*)

the needed information, but a suitable method was found in the wind tunnel with its accurately controlled stream of air moving through an inclosed channel and passing over a model firmly held on a sensitive balance. The first wind tunnel in the United States was completed by the Wright brothers in October, 1901. Although small in size, it embodied all of the essential features of a successful wind tunnel. In it were obtained the experimental data that served as the basis for the design of the first successful airplane. To dedicate this latest advance in wind tunnels as a memorial to the Wright brothers thus seems unusually appropriate.

It was a particular genius of the Wright brothers that enabled them not only to develop methods for experimental study and improvement of their basic ideas but also to coördinate and embody the results of their studies in the design of a successful flying machine. Crude as their first airplane may now appear in comparison with the modern high-speed transport, it was indeed a marvel of mechanical ingenuity and detail refinement in comparison with the first successful land and water vehicles used by man. This startling success was made possible by the inventors' scientific studies in their wind tunnel.

Naval architects employ model basins and towing tanks chiefly to improve the lines of existing hulls; automotive engineers often use service operation as the trial ground leading to improvements in land vehicles; but the aeronautical engineer must use the wind tunnel to insure the stability and controllability of his design. This, I think, illustrates the very important part that the wind tunnel plays in aeronautical progress. It was not only a most important aid in making possible the initial success of human flight, but it is the best available method for improving existing airplanes or insuring continued progress in the future. We are not dedicating this memorial to the Wright brothers simply as another wind tunnel; we are dedicating it to a special task for which it is uniquely fitted. To understand its future position in our country's aeronautical resources, we must review very briefly the history of aeronautical research.

During the early days of aviation, aeronautical research was initiated in many nations of the world, and in the course of these efforts a number of wind-tunnel types were developed: the Venturi type adopted by the National Physical Laboratory in England, known as the N.P.L. type; the open-throat type developed by Eiffel in France; and the closed-single or double-return type developed by Prandtl in Germany (see page 23). The first modern wind tunnel constructed in the United States was completed here at Technology in June, 1914. Under the able direction of Dr. Jerome C. Hunsaker, '12, this wind tunnel was operated for the benefit of American aircraft designers and contributed much early information that served as a basis for the development of present-day aerodynamic knowledge.

Turning to the more modern phases of aeronautical research, it is a fact that the performance and the flying qualities of an airplane depend primarily upon the knowledge available to the de- (*Continued on page 52*)

WHY WIND TUNNELS?

(Continued from page 50)

signer regarding the phenomena that occur during flight. From this one fact it is evident that progress in practical aviation must follow the improvement of our understanding of the problems of flight — improvement which is gained chiefly through long and laborious study of airflow phenomena under the carefully controlled conditions that exist in a wind tunnel. While airplane design has at times tended to outstrip research, the provision of wind tunnels that can reach beyond the boundaries of flight experience is self-evident wisdom.

To achieve such thorough understanding as is needed for the design of modern airplanes requires that the wind tunnel shall duplicate to a very close degree the actual conditions existing in flight. This fact led to the first major departure from the basic type of early wind-tunnel design. During the year immediately subsequent to the World War, the earlier information which had served as a satisfactory general basis for design was found to be insufficient as to detail accuracy to provide the degree of refinement that the growing importance of the airplane justified. The problem was no longer merely to maintain flight but to make the most efficient possible use of the existing engines and materials in order to achieve high performance, safety, and economy in flight. It thus became essential to depart from the simple type of wind tunnel then in use, which supplied information inconsistent with conditions existing in flight, and to adopt a type which would duplicate more accurately the correct balance between the effects of air density and air viscosity on full-sized airplanes. This led to the construction of the first variable-density wind tunnel by the National Advisory Committee for Aeronautics. With this wind tunnel, small models could be tested by the expedient of using highly compressed air, thus simulating the flight of full-sized airplanes at normal speeds, whereas previous wind tunnels had been able to simulate the conditions only for model airplanes at low speeds.

This step led to a major practical advance during the late 1920's and early 1930's — the revision of wing design to reduce the drag and increase the lift; and to a major scientific advance — a greatly improved understanding of the basic factors *(Concluded on page 54)*

WHY WIND TUNNELS?

(Concluded from page 52)

that govern the forces acting on a body moving through a fluid. The next step was to construct wind tunnels sufficiently large to test full-sized propellers and airplanes, to investigate those factors that could not be conveniently dealt with on small models. In this field, also, the United States has taken the lead, and now all major nations possess the giant wind tunnels that are an essential factor in modern aeronautical research. Through the information obtained with such equipment, airplane designers have been able to produce the outstanding machines that are now in service operation throughout the world. In the further development of special wind tunnels, increased air speed has become particularly important. As the speed of airplanes has increased, not only the propeller blades but also local parts of the airplanes have begun to feel the effects of a natural constant — the speed of sound. To deal with this phenomenon, the 100- to 200-mile-an-hour wind tunnel is inadequate. Recently, aeronautical scientists have been forced to seek answers to design problems in the development of high-speed wind tunnels approaching, and occasionally even passing, the sonic level. Where this most recent development will lead, we cannot say, but a logical conclusion is that the scientific equipment that reaches beyond present horizons will provide for the design of machines capable of operation beyond the boundaries of past experience.

The development of special wind tunnels to meet special needs has been exceedingly satisfactory in results obtained. The Wright Brothers Memorial Wind Tunnel is of a type particularly adapted to the task before it. With this new pressure-type wind tunnel providing, as it does, a wide range in air speed and a wide range in air density, there are many applications in the solution of problems now confronting the aeronautical engineer. We recognize that the separation of the effects of scale and compressibility is still a scientific unknown.

We have seen how the wind tunnel has been an essential part of the processes involved in reaching the astounding achievements of modern mechanical flight. It has served as a practical tool to investigate the capability and integrity of new designs; it has indicated the methods by which practical detail improvements of existing designs could be made. But most important of all, it has been the keenest tool available for probing the secrets of air flow to equip the modern airplane designer with a thorough knowledge of the phenomena that occur in flight. We may therefore look, for the immediate future at least, to those questions that are still unanswered as the first field of usefulness of this fine new piece of scientific equipment — the Wright Brothers Memorial Wind Tunnel. As it stands before us now, it is a tangible embodiment of the constructive and liberal wisdom displayed by our modern universities in providing fundamental research as a basis for future progress. I wish to offer my sincere congratulations to the Massachusetts Institute of Technology and to the members of its staff and the friends of the Institute who have made so fine a contribution to the cause of scientific research in aeronautics.

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TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

In the Public Service

¶ Few issues of The Review appear without mention here of Technology men who are contributing directly to the public weal at home and abroad through posts in the public service. Below, the roll is continued, and to these as well as the many others already listed, are due citations for work well done:

¶ Franklin W. Hobbs '89, President of the Arlington Mills, Boston, appointed by President Roosevelt for third term as chairman of the Textile Foundation, Washington, D. C. Mr. Hobbs's original appointment was made by former President Hoover.

¶ Carl J. Trauerman '07, President of the Mining Association of Montana, appointed by the governor of that state to a commission for studying occupational diseases.

¶ Jerome C. Hunsaker '12, Head of the Course in Aeronautics, and Vannevar Bush '16, Vice-President of M.I.T. and President-elect of the Carnegie Institution, appointed by President Roosevelt to the National Advisory Committee for Aeronautics. Edward P. Warner '17 is a member of longer standing of this committee.

¶ Eric Kebbon '12, architect, appointed by New York Board of Education to position of superintendent of school buildings, design and construction.

¶ José Augusto Padilla-Vega '20, from 1933 to 1937 member for Honduras of the Comisión Técnica de Demarcación de la Frontera entre Honduras y Guatemala. The Press of W. F. Roberts Company, Inc., Washington, D. C., has published the detailed findings of this commission, illustrated with many tables, photographs, and fine maps.

¶ Robert V. Burns '23, hydraulic engineer, placed in charge of the new laboratory of the Irrigation Department of Ceylon at Jawatte. Dr. Burns is specializing in dam problems in a scientific attempt to deal with floods.

¶ Adelaide Ross Crosman '28, formerly in charge of health education for the public school system of Malden, Mass., appointed to head a health program for adolescents to be undertaken by the Tuberculosis Institute of Chicago and Cook County, Ill.

Industrial Explorers

¶ The engineer and the scientist have assumed commanding positions in the industrial world — both as seekers for the new and better, and as administrators with a mastery of the technical complexity of business. Here are some of the latest researchers who have come to public attention:

¶ Carleton Ellis '00, inventor, last December received his 700th patent from the United States Patent Office.

¶ Theodore P. Wright '18, director of engineering of the Curtiss-Wright Corporation. His company is entering the large-transport manufacturing field.

¶ Marshall G. McCarroll '28, sound man for Paramount News, mainly responsible for development of the Mike Spider box, part of the flexible system now used by newsreel producing companies in southern California.

¶ Wilfred J. Danziger '29, chemical engineer, member of the vitamin technical staff in the laboratories of the National Oil Products Company.

¶ George E. Barker '30, recipient of an industrial fellowship at the Mellon Institute. The fellowship has been established by the Elgin National Watch Company.

¶ A meeting of "industrial explorers" took place in Rye, N. Y., on September 23 and 24. M.I.T. men are prominent in this Industrial Research Institute: Harvey S. Benson '12, United Shoe Machinery Corporation; Gardner R. Alden '13, Dennison Manufacturing Company; Maurice Holland '16, director of the National Research Council's division of engineering and industrial research; Robert P. Shaw '23, director of the New York Museum of Science and Industry; G. Elberne Hopkins '26, Bigelow-Sanford Carpet Company, Inc.; Alf K. Berle '27, United Shoe Machinery Corporation; and Frederic A. Cornell '32, Collins and Aikman Corporation.

Introduction

¶ Said Godfrey L. Cabot '81, presiding officer at the dedication of the new M.I.T. wind tunnel, introducing President Compton: "In the year 1859 died the great Alexander von Humboldt in his 90th year. He, too, was interested in aeronautics, and his notes on the flight of birds are still of great interest. It was said of him that he made all knowledge his sphere. I am happy in the privilege of presenting to you the Alexander von Humboldt of today, Dr. Karl T. Compton, President of the M.I.T."

Honors by Degrees

¶ Our July issue goes to press each year before we have received news of the manifold honors Technology men and women earn, to the pride of their alma mater, so we must flash back to June kudos in November:

¶ To C. Francis Allen '72, Professor Emeritus from the Department of Civil Engineering, doctor of engineering from Northeastern University. Before coming to M.I.T. Mr. Allen was graduated from the Roxbury Latin School, and this year, his 70th since high school graduation, he delivered an address at the school's commencement exercises.

¶ To Frances Stern '13, chief of the food clinic at the Boston Dispensary, master of arts from Tufts College.

¶ To Lewis W. Douglas '17, principal and vice-chancellor of McGill University, doctor of laws from New York University and the same degree from Brown University.

¶ To Karl T. Compton, President, doctor of laws from Northeastern University, October 3, on the occasion of the dedication of their new buildings. At this same ceremony Dugald C. Jackson, Professor Emeritus of Electrical Engineering, was given the degree of doctor of engineering.

DEATHS

* *Mentioned in class notes.*

¶ George E. Doane '74, June 3.

¶ Thomas Hibbard '75, October 4. Mr. Hibbard was secretary for his Class and was its representative on the Council.

¶ Frank D. Chase '81, May 3.*

¶ Susan Minns '81, August 2.

¶ Fred M. Gooding '82, December 21.

¶ ANSELM A. LAURIAT '84, July 5.
¶ CHARLES R. ALLEN '85, July 6.*
¶ MARY E. JONES '85, July 14.*
¶ GEORGE P. ABORN '86, July 7.
¶ EDWIN P. TAYLOR '86, September 20.
¶ EDWARD O. GOSS '87, July 4.*
¶ JAMES C. HOBART '87, August 15.*
¶ WARRINGTON G. LAWRENCE '87, July 31.*
¶ PHILLIP HARVEY '89, April 21.*
¶ CHARLES P. WETHERBEE '91, August 9.*
¶ EDMUND E. BLAKE '93, June 21.*
¶ EDWARD R. KIMBALL '93, July 7.*
¶ NATHAN CHENEY '94, August 5.
¶ JOHN C. STEVENS '94, July 10.
¶ FRANKLIN A. PARK '95, June 18.*
¶ HAROLD N. RUST '95, July 29.*
¶ RALPH N. WHEELER '95, May 6.*
¶ SEWALL CABOT '97, June 26.
¶ GEORGE W. DAKIN '98, August 16.
¶ JESSE T. LIPPINCOTT '98, June 10.
¶ THOMAS H. MINARY '00, April 3.*
¶ WALTER SCOTT '00, June 16.*
¶ GEORGE S. TIFFANY '00, June 19.*
¶ HENRY MARCUS '01, September 6.
¶ HARRY C. CROWELL '03, July 29.
¶ WILLIAM H. DONOVAN '03, April 22.
¶ L. CUSHING KIMBALL, JR., '03, June 8.
¶ GEORGE BURNAP '06, June 17.
¶ ELMER HARRINGTON '06, August 2.
¶ ROBERT HENNEN '08, January 14.
¶ GEORGE M. JOHNSTONE MACKAY '08, July 29.
¶ ROGER F. SCANNELL, JR., '08, August 19.
¶ WHITFORD DRAKE '11, August 24.*
¶ VINCENT W. ALLEN '12, August 25.
¶ HAYES B. VICKERS '12, June 11.
¶ ALBERT EMERSON '14, July 2.
¶ ROBERT E. HAYLETT '15, June 13.*
¶ CARROLL C. SMITH '17, February 12.
¶ HUGO P. GEISLER, JR., '18, September 10.
¶ WILLIAM MOY-DING '20, August 13.*
¶ SANFORD D. LELAND '22, September 15.*
¶ JOHN H. READ, JR., '23, April 17.
¶ SAMUEL D. BRYDEN, JR., '26, June 24.*
¶ ASHOD H. PARTAMIAN '28, September 17.*
¶ WILLIAM ALEXANDER, 2d, '32, February 6.
¶ JOHN W. JEWETT '32, July 29.
¶ ROBERT S. MCKAY '33, July 30.
¶ JAMES BREATHITT, 3d, '37, September 10.*
¶ IRVING P. WATSON '38, July 4.
¶ THOMAS SMITH, former staff, June 28. Professor Smith joined our Department of Mechanical Engineering in 1919 and was retired in 1935.

COMPARATIVE SCHOLASTIC STANDINGS OF UNDERGRADUATE ACTIVITY, DORMITORY AND FRATERNITY GROUPS

(Based on June, 1938, Ratings)

	Average	*Increase over June, 1937*	*Corresponding Rank in June, 1937*
1. Tau Beta Pi	4.14	0.50	2
2. Phi Beta Delta	3.62	0.12	8
3. Officers and Representatives Combined Professional Societies	3.58	*0.01	6
4. The Tech Staff	3.54	0.10	11
5. Varsity Sports Captains	3.53	0.23	24
6. Dormitory Committee	3.50	0.18	21
7. Chi Epsilon	3.482	*0.138	5
8. The Tech Management	3.477	0.377	37
9. Officers of the M.I.T.A.A.	3.47	*0.22	1
10. Wearers of Institute Insignia	3.466	0.256	33
11. Sigma Alpha Mu	3.46	0.05	14
Average of 192 men engaged in athletic activities	3.45	0.18	..
12. Technique Management	3.446	0.816	44
Average of 592 men in 20 activity groups	3.44	*0.04	..
Average of 172 men holding managerial positions	3.438	0.158	..
13. M. I. T. Student House	3.424	*0.21	3
14. Phi Gamma Delta	3.42	0.186	28
15. T.C.A. Cabinet	3.403	*0.026	13
16. T.E.N. Management	3.40	*0.08	9
17. Voo Doo Management	3.389	0.039	19
18. T.E.N. Staff	3.388	*0.162	7
19. Phi Kappa Sigma	3.379	0.009	16
20. Beta Theta Pi	3.378	0.218	35
21. Theta Xi	3.37	0.56	43
22. Wearers of the "T"	3.362	0.032	20
23. Phi Delta Theta	3.36	0.09	26
24. Varsity Sports Managers	3.354	0.534	42
25. Institute Committee	3.352	*0.028	15
26. Alpha Chi Sigma	3.351	*0.279	4
27. Delta Psi	3.347	0.114	29
28. Sigma Alpha Epsilon	3.345	0.175	34
Average of 420 dormitory residents	3.34	0.03	..
29. Delta Upsilon	3.34	*0.02	18
30. Theta Delta Chi	3.33	*0.12	10
General average of all undergraduates	3.31	0.02	..
Average of 163 men on staffs of activities but not holding managerial or executive positions	3.31	*0.064	..
Average of 172 men in publication activities	3.30	0.04	..
31. Technique Staff	3.271	*0.017	25
32. Kappa Sigma	3.27	*0.16	12
33. Chi Phi	3.26	0.18	38
34. Phi Sigma Kappa	3.257	0.118	36
Average of 638 members of 23 social fraternities (Does not include: Tau Beta Pi, Alpha Chi Sigma, Chi Epsilon)	3.24	0.01	..
35. Alpha Tau Omega	3.22	0.21	40
36. Delta Kappa Epsilon	3.20	0.27	41
37. Phi Mu Delta	3.17	*0.141	23
38. Phi Beta Epsilon	3.10	*0.115	32
39. Delta Tau Delta	3.09	*0.15	27
40. Voo Doo Staff	3.08	*0.14	30
41. Sigma Chi	2.97	*0.25	31
42. Lambda Chi Alpha	2.93	*0.434	17
43. Sigma Nu	2.80	*0.513	22
44. Theta Chi	2.79	*0.349	36

*Decrease

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Technology Club of Bridgeport

The Club opened its season on October 27, with Frederick K. Morris of the Geology Department at the Institute as guest speaker. Professor Morris, who returned this fall from a year's field trip abroad, told the group some of the high lights of his trip.

Two more meetings are planned for the 1938–1939 season — one to take place the latter part of January and the other in March or April. Each will be a dinner meeting with a guest speaker. — FREDERICK W. GREEN '32, *Secretary*, Nash Engineering Company, South Norwalk, Conn.

Technology Club of Lake Superior

The club members of this district had the opportunity this summer to show a few Alumni from other parts of the country our shipping and iron ore industries. William W. Lewis '89 of Boston subway fame was an interested visitor for a few days, and Jonathan Noyes '12 renewed acquaintances with his old friends in this area. Mr. Noyes, by the way, is sending his boy, Jonathan, to the Institute this fall. — WILLIAM C. LOUNSBURY '03, *Secretary*, Minnesota Power and Light Company, First Avenue West and Superior Street, Duluth, Minn.

M.I.T. Club of Northern New Jersey

Plans for the two smokers and the banquet for the present season are rapidly being completed. The first smoker will be held on November 18 at the Newark Athletic Club. Dr. J. O. Perrine, associate editor of the Bell System *Technical Journal* of the American Telephone and Telegraph Company, will present a demonstration lecture of wide general and scientific interest on the subject "Waves, Words and Wires." The smoker will be preceded by an informal dinner for those who, for purposes of conviviality or convenience, wish to attend.

All Alumni who reside in northern New Jersey automatically become members of the Club. There are no dues and no obligations other than to help the cause along. If you are a newcomer or have moved or have never received notices of meetings in the past, please send your name and address to the Secretary to insure receiving official notice of the Dr. Perrine meeting. — CLAYTON D. GROVER '22, *Secretary*, Whitehead Metal Products Company of New York, Inc., 303 West 10th Street, New York, N.Y. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N.J.

Niagara Falls Technology Club

In accordance with the constitution and bylaws of the Niagara Falls M.I.T. Solviet, the members and their families gathered at the Grimsby Country Club at Grimsby, Ontario, on August 20 for the annual picnic. Golf, swimming, tennis, and bridge were the main attractions of the afternoon prior to an excellent dinner.

When the prizes were awarded, the family of Earle Hauman '16 was declared the winner, as Hauman won the men's golf award and his daughters won both of the tennis prizes. Mrs. Percy Blood won the women's golf award, and Mrs. Lester White and Mrs. William Leach were the winners of the bridge tournament.

At the conclusion of the picnic a rising vote of thanks was given to Michael Kelakos '35 for the excellent arrangements that he made. — CALVIN H. MOHR '33, *Secretary*, 1224 Cayuga Drive, Niagara Falls, N.Y.

M.I.T. Club of Western Pennsylvania

Early in July, W. E. R. Covell '23, President, invited officers of the Club and their wives to help him inspect the dams, bridges, and waterways of the beautiful Ohio River. The *Shawnee*, a luxurious, flat-bottomed, government inspection boat with two Diesel engines, carried the party 30 miles down the river and back. After a tasty buffet lunch, the party gathered on deck to sing the good old songs. Little club business was transacted, so we found another cruise (without the ladies) advisable late in August. On this second trip we inspected the waterways of the Allegheny River. No one in the group can ever forget the gorgeous sunset over the hills of Pittsburgh or the scenery along the river at dusk. The business aspect of the meeting concerned plans for the coming year, and included arrangements for the first meeting at the University Club, held on September 29, at which time B. K. Shaner of the Koppers Coal and Construction Company was the chief speaker.

Officers present at the summer business meeting were W. E. R. Covell '23, President; Charles M. Boardman '25, Vice-President; Robert A. Olsen '35, Secretary; Warren D. Smith '27, Assistant Secretary (for membership); Stanley T. Johnson '36, Assistant Secretary (for publicity); Warren I. Bickford '01, Elbridge J. Casselman '15, and E. Neal Wells '29, Executive Committee. — ROBERT A. OLSEN '35, *Secretary*, 258 North Bellefield Street, Pittsburgh, Pa. STANLEY T. JOHNSON '36, *Assistant Secretary*, Schenley Arms Apartments, Bigelow Boulevard, Pittsburgh, Pa.

Washington Society of the M.I.T.

The last meeting of the spring season was held on June 17 at 5:30 P.M. at the Cosmos Club. Charles P. Kerr '11 sang his swan song as president. After his opening remarks, he turned the meeting over to Proctor L. Dougherty '97, Honorary Secretary for Washington. Dougherty reported on his visit to the reunion and announced that the total of pledges from 5,000 M.I.T. men from all states of the Union amounted to $400,000. He also announced that Francis Walker '92, chief economist of the Federal Trade Commission and son of a former president of M.I.T., will have charge of spending $50,000 for investigating the automobile industry. He stated in addition that he had knowledge of a position for an architect in the government service and asked that anybody knowing of M.I.T. men interested in such a position get in touch with him. In a semiserious mood Mr. Dougherty questioned whether there should not be a door prize for the Class showing the largest turnout in attendance at each meeting of the Society, the members of that Class to draw lots for the prize. There is some real merit in this suggestion, and we have hopes that we shall see a tryout shortly.

Mr. Dougherty introduced last year's scholarship award winner, Albert H. Bowker '41, who was sent to Washington from the Woodrow Wilson High School. Mr. Bowker was given two minutes to tell what he had learned in the past year and did a very fine job, reporting on the riot by the Tech men, the progress on the new Rogers Building, the purchase of Riverbank Court Hotel for a graduate house, the starting of work on the wind tunnel, and the loss of Dr. Bush to the Carnegie Institution. The next speaker introduced was Charles Frederick Leiserson, the winner of the Washington Scholarship for the current year. Leiserson, who is 16, is also a graduate of Woodrow Wilson High School. His father is a graduate of the University of Wisconsin and a Ph.D. from Columbia; his mother is a Simmons alumna. Leiserson is noted for being the graduate who talks the least but says the most and has a fine record in scholastic work in high school.

Following these remarks, Mr. Kerr called for the report of the nominating committee for officers for the ensuing year. In the absence of A. B. McDaniel '01, chairman, J. W. Clary '96 of the nominating committee presented the following slate: for president, Edwin W. James '07. Mr. James is chief of the division of highway transport of the Bureau of Public Roads in charge of the Inter-American Highway work for the government. For vice-president, Edward D.

Merrill '09, President of the Capital Transit Company; for treasurer, Charles H. Godbold '98 of the Bureau of Construction and Repair, Navy Department; for executive secretary, Henry D. Randall, Jr., '31, who is in the x-ray and other technical apparatus supply business in Washington; for corresponding secretary, William K. MacMahon '22, with the Rosslyn Gas Company, Arlington, Va., and the Alexandria Gas Company, Alexandria. For members of the executive committee, in addition to the foregoing ex officio members: Paul Weeks '02, Merton L. Emerson '04, and William B. Poland '90. For the Society's representative on the Alumni Council, Major Emerson. After an unsuccessful call by Mr. Kerr for nominations from the floor, Larry Conant '21 moved that one ballot be cast for the list of nominees, which was done.

Mr. Dougherty offered a resolution thanking the retiring President for the masterly way in which the office had been conducted since the death of Dr. Tyler '84. Major Emerson also commented upon the "swell job" which had been done and offered his regrets that Mr. Kerr found it impossible to continue in office. The new President, Mr. James, was unable to attend; when the Vice-President, Ed Merrill, was called upon for remarks, he promised in his inaugural speech that he would get anything from Congress desired by any of the members and all we had to do was to come around to him for our share in the "pork barrel." Two appropriate movies were then shown, featuring "The Beavers at Home" and "Beaver Farming." These movies, produced by the Bureau of Biological Survey of the Department of Agriculture, proved very interesting. Following the movies, we enjoyed an excellent dinner served by the Cosmos Club.

The following members and guests were in attendance: Edward M. Lee '25, James G. Bowen '30, Henry M. Loomis '97, Frederick E. Fowle '94, William K. MacMahon '22, Henry C. Morris '00, Frederic W. Southworth '00, John Boyle, Jr., '01, David A. Werblin '36, Ernest Underwood '38, Raymond Underwood '29, Kenneth P. Armstrong '10, Lawrence W. Conant '21, Frederick W. Turnbull '29, Joseph W. Clary '96, Henry D. Randall, Jr., '31, Perry R. Taylor '21, Alfred E. Hanson '14, Frank W. Milliken '04, Hewitt Crosby '03, Julius E. Nolte '98, Charles P. Kerr '11, Albert H. Bowker '41, Charles F. Leiserson '42 (guest — scholarship holder for this year), Proctor L. Dougherty '97, Robert K. Thulman '22, Neil B. Musser '23, George W. Stone '89, John A. Plugge '29, Amasa M. Holcombe '04, Edward D. Merrill '09, and Merton L. Emerson '04.

The first meeting of the fall season was held on Friday, September 16, at 5 P.M. at the Cosmos Club, the announcement calling for "An Hour of Magic" by Ray E. Otterback and Frederick H. Untiedt '22. The meeting came fully up to expectations: Our new President, Edwin W. James '07, welcomed the members, including many new faces. When the meeting was turned over to our Honorary Secretary, Proctor L. Dougherty '97, he introduced a number of the newcomers to the Society. Mr. Dougherty announced that the following men from Washington were awarded scholarship help of some kind during the current year, in addition to the regular Washington Scholarship, which, as previously mentioned, had been awarded to Charles Frederick Leiserson: Robert McBride, winner of the Army, Navy, and Marine Corps Scholarship; Donald W. Augusterfer of Central High School, Robert R. Close of McKinley Technical High, and Thomas E. Hicks of Woodrow Wilson High School, other scholarship aid. Mr. Dougherty expressed the appreciation of the scholarship committee of the Society for the manner in which its recommendations had been so closely followed in the awarding of scholarships. He also read a letter of welcome from Dr. Compton, giving notes from M.I.T. as to the expected size of the freshman class (640), the new buildings under construction at the track house, gymnasium, and so on.

President James then took over the meeting and spoke of chemical engineering as an offshoot from alchemy, stating that ours was strictly a scientific meeting and that we still had black magic in our midst. He even went so far as to outline the effect of black magic in creating a scandal for Marie Antoinette and causing the French Revolution. He then introduced Frederick H. Untiedt '22, President of the Washington assembly of the Society of American Magicians. After a short talk, outlining the organization of the national society and its branches and the functions of these branches, Untiedt obliged with one of his disappearing tricks, with his usual line of appropriate chatter. He then introduced Ray Otterback, Secretary of the local assembly, who worked a number of most difficult, in fact most mystifying, eye openers. After this session, it was evident that we had witnessed the impossible, or some of our members were more faithful to the magicians than to the Society.

Following the "Hour of Magic" a delightful dinner was served by the Cosmos Club, and we adjourned at about 7:30 o'clock. The following M.I.T. men were in attendance: Henry D. Randall, Jr., '31, Edward D. Merrill '09, Edwin W. James '07, Henry C. Morris '00, Benjamin A. Howes '97, Proctor L. Dougherty '97, Joseph Daleda '34, Henry C. Hoar '25, George E. Wuestefeld '34, Pat J. Harney '31, George E. Marsh '02, Frank L. Ahern '14, Paul A. Blair '05, William K. MacMahon '22, Gordon R. Williams '29, Bertrand L. Johnson '05, Marshall M. Holcombe '36, William T. Johnson, Jr., '17, Carl N. Pratt '26, Harry B. Swett '25, John Ade Plugge '29, Ben E. Lindsly '05, Arne H. Ronka '23, James Swan '91, Walter L. Cook '03, John C. Damon '05, Charles H. Godbold '98, Frederick H. Untiedt '22, Paul Weeks '02, Alfred E. Hanson '14, Maurice B. Landers '05, Frederick W. Swanton '90, Benjamin S. Malin '34, Al F. O'Donnell '19, Ormond M. Lissak '30, Walter I. Swanton '93, Perry R. Taylor '21, Martin Boyle '98, Allen B. McDaniel '01, Chester H. Hosmer '25, Ernest L. Patch '10, Kenneth Bernard '22, William S. McClenahan '38, Mario Caputo '31, Albert F. Bird '30, John D. Fitch '24, Frederick W. Willcutt '27, Harry P. Sweeny '08, George D. Fife '24, Hewitt Crosby '03, Horace E. Weihmiller '25, Joseph C. Dort '09. — HENRY D. RANDALL, JR., '31, *Secretary*, 119 South Chelsea Lane, Bethesda, Md. WILLIAM K. MACMAHON '22, *Review Secretary*, 818 25th Street, South, Arlington, Va.

CLASS NOTES

1877

As guests of our President, Charles A. Clarke, the following members of the Class held their 61st reunion at the Exchange Club, Batterymarch and Milk Street, Boston, on June 8 at 1 P.M. In the order that they were seated at the table were Charles A. Clarke, George W. Kittredge, Joseph P. Gray, George F. Quinby, Benjamin C. Mudge, Frank I. Sherman, William H. Beeching, Arthur L. Plimpton, Byron E. Higgins, and Belvin T. Williston. Ten present out of a possible 23 known living members! Letters of regret came from Edward G. Taber and Frederick W. Wood.

My records show 104 of the Class to be deceased; six with addresses unknown; and 23 living members. One member, Edward W. Davis, died during the last year. Considering the ages of those present — the youngest 81 years and the oldest 89 years — they seemed in good health with one exception: Joseph P. Gray fell last Christmas and fractured his hip. With the aid of his nurse and one of his classmates, he walked to and from the elevator and his seat at the table.

It occurred to me to have some of the members of our Class add for this column their impressions of the reunion. In addition we print the messages on two postals received from Francis H. Bacon from his home in Turkey.

The account of our meeting given by George W. Kittredge was addressed to President Clarke, who desired that it be printed in the class notes. So we start with that: "As perpetual president of the ancient and honorable (with emphasis on the honorable) Class of '77 M.I.T., I want to express to you the gratitude I feel for your having made possible the class reunion at luncheon on June 8 last.

"When it is realized that we entered as a class of 104 and that during our four years at Tech we accumulated — some for a term, some for a year or other indefinite time — 36 other students so that the total number associated with us was 133, and when it is realized that out of the 133 only 23 were living at the date of meeting, that 61 years had elapsed since our graduation and our separating to the various quarters of the globe, and that the youngest in attendance had passed his 81st birthday — when all of this is realized, a feeling of wonder and gratitude

1877 Continued

comes over me and must have come over all of those present that we had 10 present at that reunion — wonder that, of those living, so many should have turned out and gratitude that the comradeship and fraternal spirit shown was so youthful, so cordial, and so evidently sincere.

"I look forward from year to year with the keenest anticipation to these reunions. I always count on seeing you, our worthy President; Williston, our indefatigable and efficient Secretary; also Beeching, Gray, Higgins, Mudge, Plimpton, Quinby, and Sherman. I was sorry not to see Hibbard, who was present the year before, and sorry, too, not to see Wood, who favors us all too seldom with his presence.

"The outstanding feature of this last reunion was the entrance of Gray to the luncheon room and the spontaneous greetings that were showered upon him. He was the last one to arrive; so all the rest of us were there to give him the glad hand. He is our senior class member. About Christmas of last year he had a fall and broke his hip. It required spirit, will power, and devotion to the Class for him to come, and I am sure we all deeply appreciated his being there. He has ever been one of our most constant attendants.

"I cannot dwell upon each of those in attendance, but each contributed by his presence and actions to making the event a memorable one. We are all deeply indebted to you not only for the fine luncheon but for having brought so many of us together for such a splendid reunion. May we all be present at many more."

The Secretary received the following note from Gray: "Have yours of the 14th. Should have written earlier but have been a little under the weather, which has prevented my writing any letters. Am now beginning to feel in better shape. Our annual meeting was a great success, and I certainly enjoyed being there, especially as the members present seemed to have enjoyed my being with them. You are to be congratulated on getting out so many, considering the age of the members and the small number left."

Plimpton sent the Secretary the following letter: "I find our class reunions are more interesting than ever as time goes on. I wish that the missing ones could have been there. How we missed good old Bacon. — It is not generally known that three of our Class for the last two or three years have had really a double reunion. Soon after graduating, Gray, Kittredge, and Plimpton had their first job surveying a number of pieces of property belonging to the Tufts estate in Weymouth. At the house where we boarded there was a young lady named Miss Fiske. She had recently been living several years in West Roxbury when she discovered that one of her neighbors was one of the surveyors that she had known at Weymouth back in '77.

"She got in touch with him, and after our reunion in 1935 the three Weymouth surveyors met their early acquaintance and recalled some of the events of that time. One of the most amusing of these was the day of the missing hat. About ready to start off for the day's work, Plimpton could not find his hat anywhere. The minister who boarded there was seated on the sofa. Miss Fiske said to him: 'You don't suppose you are seated on it, do you?' He said he did not know, but jumped up, and there it was. Plimpton got his hat, and off they started. There have been two or three double reunions since this first one."

Bacon's post card to Williston of June 26 contained the following message: "Your letter of May 12 was forwarded from Athens, followed me to Stambul, and I got it on *June 8*, the very day of the class meeting at the Exchange Club! I saluted you all in spirit. I had just returned from a glorious five weeks' stay in Athens, where I had many friends and a wonderful visit to all the Greek things that interest me so much, while you shot off 'Honorable Artillery' to your English veterans on the Common, and now you are glad to get back to your darkroom and potato patch. Good luck to you, old boy, and my love to '77."

On July 21 Bacon wrote: "I wrote you June 26, and soon after I got yours with the old boys' signatures. Tough luck for Joe Gray to bust his hip. I was glad to see the names of those old lads, written with their own fists. Good idea of yours to pass it along to me away off here in the Hellespont. I wrote you of the glorious month I spent in Athens. Too much to tell on a post card. Love and greetings to '77 and to B. T. W." — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1881

Elsewhere in this issue is printed the sad news of the death of our classmate Frank D. Chase. Elizabeth Chase has written an appreciation in the September issue of *Mining and Metallurgy*, and we reprint it here for those who wish to remember Frank as the forthright man he was: "Frank D. Chase was one of those old-time mining engineers whose lives made commonplaces of 'Moving accidents by flood and field, of hairbreadth 'scapes i' the imminent deadly breach.' Like the others of his generation and class, he took them all in his stride.

"His first foreign assignment was in 1888 to Siehuntung, China. There, far underground in an abandoned mine with one Chinese coolie, he had the unpleasant experience of having his light go out. Whereupon, silently, the coolie left him. Shouts of 'Hey! Come back. Wait!' produced no effect. Bitterly the young American cursed an education at the Massachusetts Institute of Technology that had given him a degree in mining engineering and geology, but no Chinese. For what seemed days and months he waited there in pitch blackness, not daring to move, wondering in growing horror about the workings of that Chinese boy's mind. Finally, a thousand miles away, he saw a light. Speechlessly as he had gone, the boy came back.

"In 1904, after several years in and out of the United States, Mr. Chase went to Burma for Allis-Chalmers to report on an abandoned tin mine, to find out whether it would pay for reopening. The mine was a grim place, with chained skeletons in unexpected places in the old workings. But one experience of the trip turned out to be rather a lark, with a Robin Hood flavor. The engineers and a guide or two found themselves at nightfall separated from their 'grub' by a suddenly swollen mountain stream. On one side were the hungry explorers, on the other the camp supplies. 'If we could shoot an arrow across that stream,' someone suggested, 'with a string attached, we could get food.' The Englishmen were all enthusiasm. Among them they manufactured a bow and arrow of sorts. Then they solemnly tested themselves to see who had the best eye and the steadiest arm. It was the Yankee. And the Yankee, very nervous inwardly, but outwardly calm, shot that arrow across the stream to the eager natives, who knew exactly what to do next.

"After that came years in Mexico — Trojes, Mexico City, and finally Monterrey, where he stayed from 1908 to 1919, as superintendent of the smelter of the Cia. Minera Fundidora y Afinadora de Monterrey, S.A.

"He was there when Carranza and Villa alternatively took and retook the city — and the smelter. The sieges had their lighter moments. Once the Villistas looted the house in such haste that they overlooked a full bottle of brandy in the butler's pantry. But they did not miss a bronze horse on the eight-day clock. That went. So did six pairs of shoes, neatly polished and ranged in order by the faithful houseboy. When Mr. Chase got back to his house, after the soldiers had left, he found six pairs of broken, ragged *huaraches* ranged with equal neatness on the site of his vanished shoes.

"Everything edible had gone from all the houses in the enclosure. But the Chinese cook produced a live piglet that he had secreted somewhere, and Mr. Chase brought out some fruitcake that the womenfolk had left to ripen when they returned to the States. Fresh pork and well-brandied fruitcake after fourteen hours of hunger. A feast for the gods! And when dinner was over the superintendent slept soundly in the comfortable consciousness that the gold bars — ready for shipment — were still hanging safely in the well where he had cached them.

"The worst time was when the Villistas came back, months later, and ordered all the Americans lined up against the wall to be shot. They claimed someone had resisted their entry. In vain the Americans stormed, pleaded, invoked their flag. They were ruthlessly prodded into the refinery, where there was a good place for the execution. The rifles were actually leveled when Bob Harding, an Englishman, recognized one of the scarecrow soldiers as an ex-workman of his, and called him by name. Eventually they were granted permission to go to the city, if they could make it. And they walked two miles, not daring to run, through a guerilla battle, till they reached the

1881 Continued

British consul's house. The American consul was under arrest. That was in 1912, before Wilson got sensitive.

"In 1919, the smelter was bought by a German company. Mr. Chase decided to retire, and went to St. Cloud, Fla., where he became interested in politics, unconsciously following the example of a more famous American mining engineer. St. Cloud was in a bad way — bonds in default, taxes uncollectable, roads and drainage dangerously neglected. Mr. Chase tried to explain to the citizens what ought to be done, and to his unbounded astonishment they promptly elected him Mayor. That was in 1928. He went briskly to work, and as soon as he got the city on its feet and functioning, they kicked him out. He was not the only mining engineer to learn the difference between a political job and a real job.

"His death came on May 3, when he was driving home from Florida to go to his summer place in Maine. The car got out of control, and went over an embankment, turning over three or four times. Mr. Chase never recovered consciousness." — FRANK E. CAME, *Secretary*, Chambly Canton, Quebec, Canada.

1883

To celebrate the 55th anniversary of graduation, the Class held a reunion on Cape Cod at Gray Gables Inn, former residence of President Grover Cleveland, on Buzzards Bay at the southern entrance to the Cape Cod Canal. The location is ideal, and the weather was delightful.

The notification to the Class follows in part: "To the Prehistoric Senilities of '83: The venerable Secretary staged a trip to the Cape to locate a spot where the temporary Old Men's and Young Women's Home could be established for the sixth of September and following days. Julien Vose will bring along a host of colored motion pictures of his adventures here and abroad. There is an obstacle golf course on the lawn. Excellent sandy beach and warm water. Big boats pass in and out of the canal. Always a breeze across the water. Magnifying lenses, ear trumpets, arm slings, crutches, and carpet slippers provided free! Charming place and excellently managed inn."

So on Tuesday, September 6, members of the Class with their wives or daughters arrived for luncheon. Others came that afternoon and the next morning. Some stayed two days; some, three. A putting tournament over the obstacle golf course was played Tuesday afternoon, and after dinner Vose's pictures were displayed to an admiring throng of 20 or more. Wednesday morning a class meeting was held, and letters were read from classmates residing too far away to come for so late a vacation. Two letters came from Florida, another from Buffalo, and sundry from nearer Boston.

Pictures of the Class as we were when graduated were brought by George Underwood, as well as those taken at the 50th reunion at M.I.T. in 1933. The contrasts in appearances were appalling but the gains in wisdom and serenity were compensating — somewhat!

Breakfasts, luncheons, and dinners around a horseshoe table were jovial, as the food was excellent and ample. Wednesday afternoon the ladies went to the motion pictures, Chase and Underwood golfed at the sporty Coonemessett Country Club, some 12 miles away, while others putted the obstacle links again or lounged in steamer chairs watching the passing flotillas. Altogether a most restful and delightful occasion.

P.S. Crutches and carpet slippers not called for! — HARVEY S. CHASE, *Secretary*, Bridge Street, South Hamilton, Mass.

1885

The Secretary has the sad duty this month of reporting the deaths of two distinguished members of the Class: Mary Elizabeth Jones and Charles Ricketson Allen, both of whom passed away during July.

Dr. Jones was one of America's first female medical graduates and a scholar of brilliance. She attended M.I.T. as a special student during 1880–1881 and again during the years 1882–1885, and was recognized as a member of our Class. She was born in Boston in 1855, took the degree of A.B. at Vassar and that of M.D. in 1890 at Johns Hopkins. She was a breeder of collie dogs that took many prizes, but she led the life of an eccentric recluse, never following her professional calling. She died a spinster.

Allen, one of the brilliant men of the Class, died at his home in San Antonio, Texas, at the age of 76. Educated in his youth in New Bedford, Mass., he later taught chemistry in the high school of that city. As a teacher he was practical, thorough, and commanded the personal respect of students, who dubbed him "Cully" in affectionate familiarity. He was a pioneer in the field of industrial education, now termed vocational training, and was the first chairman of the board of the New Bedford Industrial School. While acting in this capacity he was selected to supervise the Massachusetts State Board of Industrial Education.

At the time of America's entrance into the World War in 1917, Allen was called to Newport News, Va., as assistant superintendent of training for the Emergency Fleet Corporation, where he is said to have trained an army of young men second in number of men only to that trained by General Pershing. After the War, in recognition of Allen's ability as an educator and executive, he was called to Washington, D.C., where he acted as consultant in Federal vocational education. He retired from this post in 1934 after 16 years of service. While working for the government, he traveled widely, supervising schools in Minneapolis, Niagara Falls, and other places.

Allen was an enthusiastic yachtsman. During his residence in New Bedford, he was a leader in that sport and the title "Skipper" was associated with him to his death. He was the son of Lieutenant Colonel John A. P. Allen of Civil War fame. He was married twice but left no children. He received his S.B. degree from the Institute with our Class and was made an M.A. by Harvard in 1908. In 1927 he was given the degree of D.Sc. by Stout Institute of Menomonie, Wis.

Thus is outlined the life of one who was gifted with ability, who carried citizenship and public service to a high degree, and who illustrated the purpose of his alma mater. A classmate who had just heard of his death writes: "He was an interesting character, and I always enjoyed calling upon him when passing through Washington." —ARTHUR K. HUNT, *Secretary*, 145 Longwood Avenue, Brookline, Mass.

1887

The annual '87 class dinner was held, as usual, at the Parker House, Boston, on Sunday, June 5, attended by 12 members as follows: President Taintor, W. R. Thomas, Curtis, Schmidt, Cole, F. A. Kendall, Carter, Tripp, A. L. Cushing, Lane, Cameron, and Very — all of whom (with the exception of Cushing and Cameron) attended the exercises at Rogers and in Cambridge on Monday. A pleasing feature of the dinner and of the Alumni Day luncheon and attendant features was the presence of Frederick A. Kendall, back again in the fold after an absence of many years, who was warmly greeted by all. May we see him more frequently in the days to come!

Two letters, both of which are of deep interest to the Class, were received by the Secretary just too late for publication in the June Review. Mrs. Granger Whitney writes that the Class may be interested to know that a memorial service and dedication was held in the Williamsburg, Mich., Church on December 12. She states that "a fund was raised in memory of Granger, and the interior of the church was put in order and dedicated on its completion. At the service the minister, who had known him for 15 years, paid a tribute; one friend read Granger's verses written when he heard of Hal Souther's, Timmie Sprague's, Morton Cobb's, and Norman Stewart's deaths; and another friend read the tribute written by H. L. Lyster, a Yosemite comrade in the Spanish War. There were two vocal solos of appropriate music and three appropriate hymns, which completed a very impressive service." The second of the interesting communications referred to is from William C. Cushing, who, in reply to the Secretary's request for a literary contribution for the edification of his classmates, sent in a most interesting sketch of his career since his graduation from Tech. The Review Editors have decreed that this must wait for our next set of notes.

Since July 1, three of our classmates have passed to the Great Beyond. Edward O. Goss on July 4, Warrington G. Lawrence on July 31, and James C. Hobart on August 15. Edward O. Goss, a trustee of the class fund since the death of John L. Shortall in 1934 and always active in all matters concerning the welfare of the Class, will be greatly missed at our reunions. His narration at one of our gatherings of the carefully laid plans for the handling of the unemployment situation

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in the early years of the depression clearly showed his deep human sympathy for his fellow men, while his modest and unaffected description, at our 45th reunion, of the perfection of an improved time fuse for the British antiaircraft guns in the World War, which was instrumental in stopping the German air raids over London, revealed the tremendously outstanding contribution to the success of the Allies made by the concern of which he was the devoted head. Rare indeed are men of his type and human qualities, and great the loss to all mankind when they are taken. The following sketch of his life, with the tributes from his associates in all walks of life, is from the Waterbury *Republican* of July 5: "Leaders in industry, banking and public affairs, not only in Waterbury but throughout the state, last night expressed grief at the death of Edward O. Goss, and paid tribute to the contributions he had made to the city and this section of the country. John A. Coe, president of the American Brass Co., said: 'It has been my great privilege to know Edward O. Goss for many years as a man of strong personality. While the great Scovill Co. has claimed the larger part of his time, thought and strength, his activities were very diversified. He gave of himself unstintingly to civic interests, our Connecticut railway systems, to the Citizens & Manufacturers National bank, the Waterbury Savings bank, and many other avenues of endeavor. As the result of his untiring efforts, his wise decisions, his kindly spirit and his generally helpful attitude, industry, our state, and city have greatly benefited and his passing is an irreparable loss in many ways. We shall miss him from many a council table in the coming days. . . .'

"'He had one of the keenest intellects of any man I have ever known,' said Superior Court Judge Arthur F. Ells of Litchfield, formerly of Waterbury. 'I was always interested not only in his extraordinary ability in the manufacturing field but also in his great love for the outdoors. I have had many interesting conversations with him on his trips into the wilderness of remote sections of Canada. . . .' 'I surely was shocked to read in The Republican,' Ex-Gov. Charles A. Templeton said, 'about the death of Edward O. Goss. The city of Waterbury, state of Connecticut and nation have lost a valuable citizen. He was a kindly man of great intellect, a very thorough and capable business executive, a genuine Christian gentleman and a valuable friend of mine. The industries will miss him, also Saint Margaret's school of which he was a trustee for many years. At the last commencement it was his privilege to present his own granddaughter with her diploma. He was a very modest man and his advice was always sound and his influence farreaching. . . .'"

"Edward Otis Goss, 72, president of the Scovill Mfg. Co., and one of the foremost industrialists of the state, died of cerebral hemorrhage at his home, 117 Pine street, here yesterday morning. He was stricken Saturday afternoon and his physician, Dr. Walter L. Barber, was called. . . . Mr. Goss had been identified with the Scovill company for 50 years, during its greatest development and it was largely through his efforts and those of his father, the late Chauncey Porter Goss, that it became one of the largest brass concerns in the country. He was born in Waterbury Sept. 29,1865, the son of Chauncey Porter and Caroline (Ketcham) Goss, and was the eldest of seven children. His father had been with the company 56 years, working up from a position as bookkeeper to president. . . . Edward O. Goss was educated in the Waterbury English and Classical school and the Massachusetts Institute of Technology from which he was graduated with an M.E. degree in 1887. After a brief employment with the Waterbury Farrel Foundry as a draughtsman, he took up similar work with the Scovill company in 1888. Ten years later he became a director of the company; in 1900, assistant treasurer; in 1911, general manager; in 1918, vice-president and treasurer; and in 1920, its president. . . .

"Mr. Goss's activities also extended to banking and railroading. He had been a director of the New Haven road for the past 15 years, a director of the Connecticut Co., and the Waterbury Gas Co., now consolidated with the Connecticut Light & Power Co. For many years he had been president of the Citizens & Manufacturers bank and a director of the Waterbury Savings bank. Throughout his life he was keenly interested in civic affairs; was a former president of the board of aldermen, and former member of both the board of works and board of education. He was one of the chief supporters of the Y.M.C.A. and was always active in hospital campaigns. Several years ago he received the high honor of being made a fellow of the Royal Society of Arts in London. He was a member of the New England council, served as chairman of the power committee of the New England conference, was a member of the American Society of Mechanical Engineers, Institute of Mining and Metallurgical Engineers and belonged to the Waterbury Country club, the India club of New York and the Laurentian club of Quebec. He was a member of St. John's Episcopal church for many years. In politics he was a Republican. His favorite sport was fishing and hunting.

"On Sept. 15, 1891, he was married to Miss Harriet Wheeler, daughter of Mr. and Mrs. Moses Wheeler. They had three children, all of whom survive, Edward Wheeler Goss, former congressman from this district, now of Washington, D.C., William Middlebrook Goss, now secretary of the Scovill Mfg. Co., and Eliot Porter Goss, also associated with the company. He is also survived by three brothers, John H. Goss, vice-president and general superintendent of the company, George A. Goss and Chauncey P. Goss, 2d, both vice-presidents of the company; a sister, Mrs. Hugh L. Thompson."

Here is part of an editorial appreciation from the same paper: ". . . Mr. Goss was a hard worker, a man of character, upright integrity, and a conscientious purpose at all times to hold before him responsibility for the welfare of the great industrial group constituting the workers for the organization that he headed as president. Thus he won respect not alone for his ability but devotion in recognition of good leadership. His death stuns all with an overwhelming sense of loss that comes when a giant has fallen. Respectfully the workers addressed him as 'Mr. Goss,' but among themselves he was affectionately known as 'E. O.' . . . Strong leader that he was, he recognized the importance of the assistance of others and was always ready to give them due appreciation and credit.

"Pride in his work and keenest interest in his work characterized him from that day in 1888 when he began work at Scovill's as a draughtsman. He found in his father, the late Chauncey P. Goss, who laid down the presidency of Scovill's at his death in 1918 with a record of 56 years of service to that company, an instructor and counsellor of rare qualities. When he later came to the responsibilities of the executive position that his father had held, he, too, regarded the position as a trust and had the ambition not only to hold firm all that was good as it came to him but a determination that he, too, in his turn would keep it advancing into a greater and more efficient future. Well did he succeed. . . ."

A letter signed J. E. F. and printed in the Waterbury *Republican* was sent to the Secretary by Goss's family, and part of it is included here because it portrays so feelingly the affection and esteem of the employees of the Scovill Mfg. Co. for their beloved employer: ". . . Testimonials from public officials, business men, scientific and social associates, affirming his great worth poured in from all sides, and the press was kind and considerate in their high praise for his sterling qualities. . . . E. O. Goss, considering his achievements, was a man of marked simplicity and singular modesty. Success never flattered, nor good fortune smiled upon a man so unspoiled as he. His unpretentious and unconscious dignity always reminded me of Abe Lincoln. He radiated good humor and friendly sympathy at all times and at all places. I have in mind a testimonial that might have, I think, pleased E. O. It comes from the hearts of his old friends — the workmen of the Scovill Mfg. Co. It runs something like this: 'When "the Master of all good workmen" laid off E. O. Goss, we lost our best friend and the squarest boss in all the world.' When these old friends heard the news their comments were not so much about his skill and business ability, but rather about his genial warmheartedness and sympathy. Their mourning for E. O. wasn't concerned so much with the death of a distinguished citizen as it was with the loss of a true friend and a good boss, who for so many years lived among them and often lingered at their machines and benches. . . .

"Ever since the Goss family took over the management of the Scovill Mfg. Co., there has been a tradition among the

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workers that, come what may, good times or bad, the Gosses would never let them down. Up to the time of the labor stampede during the World war, E. O. had an intimate acquaintance with most of his senior foremen and laborers. This sincere and friendly solicitude about themselves and their families raised him high in their affections and confidence, and no reluctance or sense of social difference ever kept them from seeking his help and counsel. . . . He must have possessed that unusual quality called human understanding, that genius, so rare in business men, that sees in every man a spiritual equal — otherwise he never could have won the loyalty and admiration which his workmen always avowed for him. . . ."

Through the kindness of Frederick A. Kendall, the Secretary was advised of the sudden demise of Warrington G. Lawrence while the latter was vacationing at Portland, Maine, on July 31. The appended sketch of his life and professional career is from *The Spectator* (August 4) of Roselle, N.J., his home town: "Warrington G. Lawrence of 419 Chestnut street, Roselle, a resident of Roselle for nearly fifty years, died in Portland, Maine, Sunday. The body was brought to Roselle, and funeral services were held yesterday afternoon at 3 o'clock from his late home. The Rev. Dr. Clarence S. Wood of St. Luke's Church conducted the service. Many relatives, friends, and borough officials attended. The floral tributes were many and beautiful. Mr. Lawrence had been in ill health for some time, and was passing the summer with Mrs. Lawrence in Portland. . . .

"Mr. Lawrence was born in Baltimore, the son of the late France Lafayette and Hannah Lawrence. He was a graduate of the Massachusetts Institute of Technology and later entered the architectural field. He continued his work in the office of R. M. Hunt in New York City. Among the many buildings which he had a part in designing were the local Roselle Borough Hall, the First National Bank and the Levine Building in East Second avenue. He married Miss Caroline Baldwin, daughter of the late Mr. and Mrs. H. P. Baldwin in 1885. The Baldwin family were residents of Roselle for a long number of years. Mrs. Lawrence is the only survivor. Mr. Lawrence was active during the World War, and well-known as head of the War Saving Stamp campaign. He was a strongly civic-minded man. He was a member of the N. Y. Chapter, American Institute of Architects, Architectural League of New York; Alumni Association of M.I.T. and M.I.T. Architects."

The death of James C. Hobart of Cincinnati, Ohio, has been reported to the Secretary, but in the absence of further information it will be necessary to defer details until later.

Our classmate, Willard P. Gerrish, who has been a member of the staff of the Harvard College Observatory for more than 52 years, retired from active service on September 1. He writes: "I have been so situated that it has not seemed practicable to attend class dinners. It is possible that the new order of things will make it more convenient in the future." We certainly hope that it will. — George Sever writes from his Kingston, Mass., home that he is busy gardening and doing odd things about the house and place. "Time goes in a sort of frittering manner," he says, "nothing like the old busy engineering days." — Carter writes that he contented himself during the past summer with one or two brief week-end trips and did not haye the good fortune to run across any of the boys.

William H. Brainerd decided last February that he had gotten enough of our northern winter and would shake the dust, or rather, the snow and ice of New England from his shoes and betake himself to sunny California by motor, where he could enjoy himself for a month or two. To the Secretary he has kindly sent an interesting description of his itinerary and experiences en route, which, in part, is herewith presented: "As I wrote just before starting, we — that is my wife, son, and myself — drove to California last winter. We left Wellesley, February 10. Already we had seen two feet of snow come and go. We thought this enough for one winter, so headed south to get below the snow line. But in vain, for a three-inch, soggy fall caught us in Baltimore, just at the end of afternoon, with the streets full of cars. Crossing Baltimore is bad enough without complications, but we made it safely, putting up for the night just at the edge of the Federal district. We continued south to Macon, Ga., where we had expected to turn southwest to Mobile, but learned that there was so much reconstruction on this route that we continued south to the Gulf. This enabled us to see Tallahassee and Wakulla Spring in west Florida, which were new to us. From here we followed the coast road to New Orleans, which we reached on the seventh day out. Most of the way the road was in sight of the water, and the air was balmy. The sea food fresh from the waters of the Gulf was delicious even at the roadside stands.

"At New Orleans we rested two days. We inspected the Celotex plant at Marerro across the river, ate bouillabaisse at Antoines, ordering it in advance according to their rules. Trying a dinner at the French market, six courses for 60 cents, of remarkably good food topped off with strong black coffee served in eight-ounce water glasses. I think that a large part of the people of New Orleans emphatically live to eat. — After two days of such rest, we started on a seven days' drive to San Diego. Snow caught us again at Fort Worth; four inches of wet slush plastered onto acres of peach trees in full pink bloom. It was beautiful in color, but, I fear, not so good for the fruit. We rode over plains for the first two days in Texas; from there on to the coast it was mountainous." Because we have already used considerable space in this issue, we are saving Brainerd's interesting letter to run in another installment.

Solomon Sturges retired from the brokerage firm of David A. Noyes Company of Chicago and is trying hard to accustom himself to a life of leisure. He writes that he and Mrs. Sturges are taking a motor trip through the West and are spending a month at Santa Monica. He drove down to San Pedro to see our beloved Class Treasurer, George Otis Draper, on September 17, but found him in very bad shape and constantly growing weaker. On July 14, George asked to be relieved of the duties of treasurership of the Class, a position he had filled so faithfully for over half a century, and Ben Lane, much against the latter's wishes, was drafted into the service to carry on in George's stead. President Taintor, in making the foregoing assignment, wired George of his selection and added: "But you are Treasurer for life! Eighty-Seven salutes you!"

Phil Mosman writes that he spent a very pleasant vacation in Biddeford, Maine, last summer. He says his address is now Box 642, Church Street Annex, New York City. — George Sylvester, now and for many years of Rockwood, Tenn., and President Emeritus of the Technology Club in Knoxville, spent a number of weeks at his old home in Danvers the past summer and spent several very enjoyable afternoons with the Secretary. At the time of the annual class dinner in June he sent a photograph of a group of '87 civils, taken on the steps of the Walker Building in about 1885, which excited much interest on that occasion. In discussing the identity of the various members of the group last summer, we found a number whom we were unable to recognize, but with the assistance of Henry Hill of Augusta, Maine, we seem to have solved the mystery "with approximate exactness."

Hill says: "Your letter and the photograph arrived yesterday. I cannot tell you how glad I was to get it. What memories it brings back! This is not how good my eyesight is, but how good my memory is." The list follows: Walter S. Thompson, William B. Blake, Frank L. Solomon, William A. Whitney, Roulhac Ruffin, Steve Coombs, Harry Adams, William Hillyer, (‡) H. F. Hill, William C. Cushing, Bryant, Roy Young, George Sylvester, Percy R. Fletcher, Edward A. Haskell, Gelett Burgess, Professor Burton, Jerry Thompson, William S. Bliss, Harry Totman, James Stanwood, and Maurice Cooley. Fletcher was anchor on the Tech team of '85 or '86 which beat Harvard. I think Fred Foss was on the team. I find in my old field book while at Tech that on November 10, 1884 (my birthday), is this heading: Thompson and Sylvester — transits; Bryant and Whitney — tape; Edgett — transit; Hill, Cooley, and Thomas — notes. To find inclination of New Old South Church. I believe this and the height of Bunker Hill Monument were almost standard at the time."

Other communications received were from Gelett Burgess, Squash Cushing, Ben Lane, Frank Brett, Lonsdale Green, Dick Schmidt, F. A. Kendall, Oscar Nutter, and F. A. Thomas, for which the Secretary desires to express his deep appreciation. — William D. Sargent, who

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spent the summer in Ontario, Canada, has returned to his winter home, 3756 Pine Tree Drive, Miami Beach, Fla. — Joseph B. Gay has removed to Room 260, Park Square Building, Boston, and Solomon Sturges, when not touring the country, can be located at 942 Belle Plaine Avenue, Chicago, Ill. — Ogden Codman is reported at Chateau de Grégy, Brie-Comte-Robert, Seine et Marne, France. — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

Continuing the notes on our 50th reunion at Marblehead from the July issue of The Review, it seems to us that the Class has established several records for 50-year Classes. First and foremost we had more men present at our 50th reunion than we had at our 25th: At Wianno in 1913 we had 40 men, while at Marblehead in 1938 we had 41. We also exceeded the attendance at any of our five-year reunions from the fifth to the 45th, inclusive. At Marblehead on June 3, 4, and 5 we had seven men who had not attended any kind of a class reunion for 50 to 54 years. Of the 41 present, 23 — or 56.1 per cent — were graduates with the degree of S.B., the remaining 18 being nongraduates. Eight men played golf, either 18 or 36 holes, while three played 45 holes. The four-ball-best-ball-aggregate matches were won by Thompson and Collins. At the end of 36 holes they were even on points with Moore and Horn, so that it was necessary to play a 37th hole to decide the winners. The long-distance champion, Dwight Heald Perkins of Pasadena, Calif., motored 6,400 miles to Marblehead and return, especially to attend this reunion and was awarded a bronze medal at the reunion dinner on Saturday night. Although we now have 88 names on our class roster, only 65 of these have replied to the bombardment of letters fired at them by your Secretary during the last seven years, but 41 — or over 63 per cent — of these came to our 50th. We think this should be some sort of a record, too.

To recapitulate: At 9:30 A.M. or soon thereafter, on Friday, June 3, ten Packards, Lincolns, Buicks, and so on, left the University Club, Boston, filled with '88 men and their baggage, and headed for Marblehead via the East Boston Tunnel and the North Shore. On arrival at Hotel Marblehead all were immediately shown to their rooms selected by the Secretary the previous day. The few hours before luncheon were occupied in investigating the promontory jutting out into the harbor in front of the hotel, the two beaches, the private float for yachts and powerboats, the flower gardens, the promenade deck for games, and the crooked and narrow streets of the town. The entire length of the harbor is in full view from the promontory, and we saw hundreds of all sizes and kinds of watercraft at anchor preparing for the races of the morrow. After luncheon the golfers started out for their first round followed by a large gallery, while others motored over to the Neck to visit the Eastern and Corinthian Yacht clubs and see the many fine estates. Following a fine dinner, of which broiled lobster was the main dish, our financial matters were settled for several years to come in short order no matter how the next presidential election goes. The money poured in in such amount that your Secretary-Treasurer began to think that the statements made by Billy Besler in his Alumni Day oration might be about to come true. We retired "tired but happy."

Saturday was the big day of the celebration. In the forenoon the golfers "golfed" some more, the motorists motored to parts "hitherto unknown," and Nichols and Work "orated loquaciously and eloquently" to their hearts' content. At high noon our deciquinquennial clambake got underway under the personal direction and supervision of none other than our New Bedford whaler and clambake chef, Charlie Faunce. Exactly one and one-half bushels of the "succulent bivalves" were cooked to a turn and served by ourselves with all the fixings including "Webster sauce" and more ice-cold watermelon than we could eat. Billy Besler again came to the front by winning "under wraps" the clam-eating medal, and a photo showing him hiding behind his pile of empty shells proves it.

As soon as the clams were disposed of, we embarked from our private float on a palatial, 50-foot cabin cruiser for our voyage to Cape Anne and return, passing Misery and Wood islands on the way out and going into Salem Harbor on the way back. As our new President, Ned Webster, has spent many seasons on the North Shore, he pointed out all the points of interest seen on our cruise, including all the estates of well-known men and the reef of Norman's Woe where the schooner *Hesperus* met her fate long years ago. We saw also, close aboard, several yacht races which were taking place that Saturday afternoon.

About six o'clock we posed for our group photograph on the Fo'cas'le "deck" under the big awning, as it was sprinkling slightly at the time. Then came the grand 50th reunion class dinner with the table arranged in E formation with 14 at the head table. First came a silent toast to our late President, Alfred Sawyer, who served us faithfully for 33 years. Then the informal letter-ballot taken last fall was ratified by unanimously electing Ned Webster as president of the Class for life.

Then letters were read by the Secretary from the following absent members: Franklin Henshaw, Scarsdale, N.Y.; George Roper, Norfolk, Va.; Annie Sabine Siebert, Columbus, Ohio; B. S. Redd, New York, N.Y.; Frank Ladd, Tulsa, Okla.; Eugene Daniell, Portsmouth, N.H.; Addison D. Nickerson, Beachwood, N.J.; Richard Vose, Chicago, Ill.; George B. Prinz, Omaha, Neb.; Samuel Neiler, Chicago, Ill.; Charlie Stone, Charlottesville, Va. (telegram); John Cavanagh, Braintree, Mass.; Fred Cole, Winchester, Mass.; Billy Dearborn, Sandwich, Mass.; H. Gregory Hodgkins, Chicago, Ill.; Ellison C. Means, Ashland, Ky.; Charles Nutter, Scarboro, Maine; Edwin R. Pearson, Portsmouth, N.H.; William Proctor, Boston, Mass.; Jesse F. Stevens, Wollaston, Mass.; Albert J. Perkins, Santa Anna, Calif.; Walter Towne, West Medford, Mass.; Bertram P. Flint, Birmingham, Mich.; Frank Capen, Stoughton, Mass. — total, 24.

After the letter reading came our poet laureate, John Griffin Faxon of Fitchburg, Mass., who recited in rhythmic cadence his original poem, which we present here in prose form, as The Review does not allow us to print poetry in the class notes section: "If you should take a telescope and use the larger end and back across the years of time your eager glance should send, a group of young and virile men assembled you would find, who made the Class that I, your bard, now bring before your mind. For they had come from North and South, old M.I.T. to test, from spaces that we Easterners are wont to call 'out West.' They did not yearn for classic lore, nor did they wish to speak — as did those lads across the Charles — in Latin or in Greek. They dreamed of sciences and arts and chemistry and such, to make the world a better place, with technocratic touch. They climbed those steps on Boylston Street in 'horse and buggy days' — no alphabetic scheme of things to stun them with amaze. For Cleveland filled the White House then. On tariffs high and low men argued sharply, point by point, those many years ago. Would silver soon be wholly free — it is not so today — and what would happen, since, by chance, a Democrat held sway? The world was then at peace; we had no thought of blood to spill despite the hateful irksomeness of drudging weekly drill. Time marches on! Us, Walker sent from safe protected nest to use the knowledge gained at Tech and put it to the test. Time marches on! 'Twas not ordained that all should climb the hill, for nature is immutable, her every niche to fill. What discoveries in sciences and arts not known before — to name what '88 has wrought would fill a tome or more. We meet with thinning ranks, today; these silvern locks behold — the golden memories of love, within our hearts we hold. Of those who started on the road, I greet you here today — I pledge you, it's a wondrous thing this summons to obey. Five decades passed! These lines but ill record the years of victories and struggles, of hopes and conquered fears. Despite the burden of the years, the 'bludgeoning of fate,' we're proud, tonight, to hail ourselves — The Class of '88!"

This poem was followed by another — that of Howard Gregory Hodgkins, architect-poet — read by Everitt Kilburn Taylor. It compared in snappy manner the good old days with the present time. John Cornelius Runkle read Longfellow's poem on his 50th birthday, which led us to believe that the former could have become a doctor of divinity instead of a successful technologist. Then President Webster gave us a very clear view of the present status of the Institute from the standpoint of a life member of the Corporation. After this the 30 more or less speeches promised by the Secretary were

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delivered, including talks by Bates, Besler, Bird, Brown, Buttolph, Conner, Cheney, Eastman, Ellis, Foque, Horn, Mead, Merrell. We had also an impromptu poem by Moore, the golfer; speeches from Perkins, long-distance medalist; Professor Safford of the University of Pennsylvania; Thompson on his recent visit to England; Smoky Joe Wood on the flag we won in 1884; Taylor on his etchings of Rogers; and last but not least, Stetson who, knowing the sensation his appearance would produce, sent a telegram in advance to "break it gently to the gang." The Taylor etchings of Rogers were distributed with the dessert. We arose from our seats around the table at 11:30 P.M., after four and a half hours of "a feast of reason and a flow of soul."

Sunday morning the sunrise was beautiful, although one could not prove it by any of the 40-odd '88 men who were late to breakfast. During the forenoon some played golf, some went to "nature's church," and some were obliged to leave the delightful spot and go home. At six o'clock only five men were left to spend the night. They were repaid, however, by a spectacular event not promised by the Secretary, for at twilight while the "quintuplets" were promenading on the Fo'cas'le, a faint odor of smoke came to them, then the terrifying blasts of the town fire alarm. We rushed through the hotel office to the street to see the entire fire-fighting equipment of Marblehead lined up and ready for action. All the cars and the 5,000 inhabitants of the town were massed in front of the hotel or hanging from windows and housetops. The fire proved to be a smoldering blaze in the basement. As it was confined in a box containing oily papers, it was easily put out.

After an early breakfast on Monday morning, June 6 (Alumni Day), Ellis, Foque, Taylor, Bird, and the Secretary, all that were left of the '88 host, drove in town to Rogers for the last farewell. Ellis drove Foque and Collins via Melrose where he picked up Mrs. Ellis to take part in the festivities of the day. Sitting at the 50-year class table in Du Pont Court for luncheon with President and Mrs. Compton as host and hostess were the following '88 ladies: Mesdames Webster, Besler, Runkle, Ellis, Thompson, Faxon, and Miss Bridges. Dean and Mrs. Prescott also honored us with their presence, as well as Daniel Wheeler '68, the only member of the 70-year Class present at the reunion. A large and beautifully framed copy of Taylor's etching of Rogers was presented to Dr. and Mrs. Compton during the luncheon by President Webster as a souvenir from the Class.

Next came the '38 Class Day exercises in Lowell Court, in which the Classes of '88 and '13 participated. As predicted, the speech by William G. Besler representing the 50-year Class was worth traveling across the continent to hear. In his naturally jocular manner he gave a lot of good advice to the young men about to be graduated. The '13 orator and the seniors performed their parts to the delight of the large audience present. The new Rogers Building was impressively dedicated and then came the stein-on-the-table dinner at the Hotel Statler, where '88 occupied the front and center and demonstrated that our lung power has decreased little, if any.

At the Commencement exercises in Symphony Hall on Tuesday, June 7, '88 men in caps and gowns filled all available space reserved for the 50-year Class on the platform under the floodlights and preceded the Faculty in the academic procession.

The 41 classmates present at the reunion were: Henry Bates, Billy Besler, Herbert Bird, Leonard Brown, John Blodgett, Luther Bridges, Ben Buttolph, Bert Collins, Arthur Conner, Frank Cheney, Henry Eastman, Fred Ellis, John Faxon, Charlie Faunce, Louie Ferguson, Teddy Foque, Eddie Fuller, Harry Horn, George Hamblet, Ulie Holman, Alex Jarecki, George Lee, Bert Mead, Frank Meade, Charlie Merrell, Frank Moore, Fred Nichols, Dwight Perkins, Ralph Reynolds, John Runkle, Fred Safford, Ivar Sjöström, Edward Smith, Bob Smith, Frank Stetson, Everitt Taylor, Sanford Thompson, Ned Webster, Arthur Williams, Fred Wood, and Norman Work.

A short time before our class dinner the following telegram was received from Charlie Stone, convalescing from an operation at his Colonial home in Charlottesville, Va.: "Happy days to the Class of '88. Sorry I cannot be with you in New England on this great occasion of 50th birthday. Wish you all were here with me in Virginia — birds singing, flowers blooming, sun shining." Congratulatory telegrams were received during our dinner from the Classes of '87, '98, '03, and '13. Ninety-eight sent a delegation of two from their celebration at the Corinthian Yacht Club on Marblehead Neck, and the call was returned by three of us late Sunday afternoon.

Smoky Joe Wood brought the 54-year-old silk flag to our reunion for all of us to see and handle. He says that it is now in a glass case in the office of the Department of Military Science at M.I.T. with the following note pinned to it: "This flag was won by the Class of '88 at the Soldiers Home Bazaar held in Mechanics Building in the fall of 1884. Until October, 1917, it was carried by the Corps of Cadets, M.I.T. October to December, 1917, by the Students Army Training Corps, and from January, 1918, to December, 1924, by the Reserve Officers Training Corps."

Joseph Cooke Smith sent the following message to the reunion from his home in Clarens, Montreux, Switzerland: "Many thanks for the program of 50th reunion. Most interesting. Hope that you will have the best of good weather." — Adelbert Mead sent the Secretary, the day after the reunion closed, a 14-line "sonata," entitled, "Afterglow." This makes four poems sent in by classmates and suggests the possible publication of a volume of these on the occasion of one of our coming reunions. — The location, accommodations, food, and service at the Hotel Marblehead were all that could be desired. Manager Percival and his assistants did a fine job for us. — The Secretary wishes to thank President Webster, the reunion committee of seven, and the 14 men who furnished their cars for transportation, for their assistance in making our 50th birthday the most successful in our history. — BERTRAND R. T. COLLINS, *Secretary*, Chebeague Island, Maine.

1889

We are sorry to have to start our news this fall with an announcement of the death of Phillip Harvey on April 21. Harvey had been living in Sandwich.

The Secretary has received the following letter from Welles Bosworth: "I suppose you like to have something to say about members of the Class once in a while, in The Review. I had an amusing experience lately at the reinauguration of Reims Cathedral when they asked me to stand in the cathedral doorway and speak into a microphone 'to ten million of my compatriots' in a big United States hookup and give them a description of what was going on. I had only 24 hours' notice but I prepared a little talk, as any architect would, using the old phrase 'the architecture of a cathedral is frozen music,' and so on. As a matter of fact, I rather enjoyed it, though I suppose nobody really listened except Renee and her mother and the two children, who stood looking at me as though I were a clown in a circus. We have just returned from a week in Geneva, where I went to make a report to the Woodrow Wilson Foundation on the setting of the monument. We motored up and down, and found as much enjoyment as ever in a motor trip in France in the summertime. We stopped off to see the Abbaye de Fontenay, not far from Dijon. It is a beautiful old Romanesque thing, delightfully restored and now occupied by a rich family from Lyons who have made beautiful gardens and made everything seem to live again. The children were particularly delighted to see croquet wickets set out in the floor of the abbey.

"I wonder if you have seen Geneva of late years? It is a gay and charming little city, and that jet of water from the lake — which the hotel proprietor assured me was over a hundred meters high — is a marvelous sight, particularly when you stand with your back to the sun and see the rainbows streaking down in succession from top to bottom. We were planning to come over again this summer to see the completion of the new building, but Carlson ['92] and Stone and Webster have put it through so smoothly that my presence does not seem to have been needed over there, and we have postponed coming. You may be sure we shall let you know when we do come again, for you were so nice to us last year you will be one of the first persons we think of. It makes me awfully sad to think that we shall not find Frank Hart. What a great gentleman he was! . . ."

The Paris art magazine "*les artistes d'aujourd'hui*" has in its July number an appreciation of Welles's talent as a

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painter and a full-page reproduction of one of his oils, entitled "Le Musée à Olympia," which it states "is a veritable marvel of technique." It speaks also of Welles's work as general secretary of the Rockefeller Committee for the restoration of the palaces and gardens of Versailles and Fontainebleau and the Cathedral of Rheims and of his attainments as academician, commander in the Legion of Honor, and president of the University Club of Paris. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

1891

Our friend and classmate Charlie Wetherbee passed on at home in Bath, Maine, on August 9. The following is from a local newspaper: "Charles P. Wetherbee, a former vice president and superintending engineer of the Bath Iron Works and a personage of international note in the world of marine engineering, died suddenly on August 9. He recently returned from a trip abroad, during which he attended the sessions of the International Conference of Naval Architects and Marine Engineers, held at London, Glasgow and Newcastle. Also, he was entertained at Paris, France, by Augustin Normand, famous French engineer of Le Havre, for whom the Normand boilers, used in Bath Iron Works naval construction of years ago, were named.

"One of the Shipping City's outstanding men, Mr. Wetherbee was born in Detroit, Mich., Feb. 18, 1871, a son of George C. and Mary Phelps Wetherbee. His father served as a captain with the Union forces in the Civil war. Entering the Massachusetts Institute of Technology in 1887, Mr. Wetherbee graduated in 1891 and the same year was appointed instructor in Naval Architecture at the Institute, serving until early '92 when he was one of two young men selected to pursue further education at the École d'Application du Genie Maritime, at Paris, France, graduating in 1894. Returning to this country, Mr. Wetherbee entered the employ of the Newport News Shipbuilding & Drydock Co. as a draughtsman in the office of the superintending naval constructor, remaining there until 1895.

"On Jan. 14, 1896, he married Miss Katherine Ellen Brown at Reading, Mass., the latter's home, and then assumed duties as a draughtsman with the Columbian Iron Works, Baltimore, Md. About this time the old Bath Iron Works, headed by the late Gen. Thomas W. Hyde, was coming to the front in the matter of naval construction and the General, on a visit to Washington, inquired as to where he might locate a young man to send abroad for the purpose of studying the Parsons Marine Steam Turbine engines. Mr. Wetherbee was recommended and his long association with the Bath concern got underway.

"Mr. Wetherbee worked out the development of the turbine for Bath-built vessels with Sir Charles A. Parsons of Newcastle-on-Tyne, and with such other famous engineers as Sir John H. Biles of Glasgow and London and J. Augustin Normand of Le Havre, France, recognized at the time as the leading designer and builder of torpedo boats in the world. He rose to the position of superintendent of the engineering department at the Bath plant and in 1905 was made a director of the concern. In February, 1911, he was made vice president and superintending engineer. During his illustrious career in local shipbuilding, Mr. Wetherbee was responsible in a large way for the design of the machinery for such crafts as the battleship Georgia, scout cruiser Chester, and 25 destroyers. The plans for the last 11 of these destroyers, evolved by him, were also used in other American shipyards.

"With the closing of the Bath plant in 1925, he became associated with the Westinghouse Electric & Mfg. Co., as a consulting engineer and later served in a similar capacity for the Bethlehem Shipbuilding Corp. He was onetime president of the Bath Savings Institution and, at his death, was a trustee of the Old Ladies' Home, Old Folks' Home, Memorial Hospital, Patten Free Library, and a director of the local branch of the American Red Cross. He was a member of the Loyal Legion, through his late father, Capt. Wetherbee. Though a public spirited man of a highly generous nature, Mr. Wetherbee was an unusually modest and retiring gentleman and never entered public life as an office seeker. Beside his wife, Katherine, he is survived by a son, George B. Wetherbee, Braintree, Mass., and two grandchildren, Katharine and Paul."

William J. Roberts died at his home in Tacoma, Wash., on April 6. The following is from a Tacoma paper: "Mr. Roberts was one of the best-known civil and sanitary engineers in the northwest. When he first came to the state he was an instructor in mathematics and civil engineering at Washington State college and engineers who attended his classes have directed construction on practically every big job in this part of the country, including the Cushman plant and the Bonneville and Coulee dams. His students and graduates called him 'Baldy' Roberts, he was that kind of a man.

"When he left the state college in 1909 he went to Medford, Ore., where he installed the water and sanitary systems. Later he was an expert on the famous Cedar river controversy between the city of Seattle and the Milwaukee railway. Coming to Tacoma in 1914 Mr. Roberts was engineer for the inter-county river improvement and directed the straightening of the Puyallup, Stuck and White rivers. Since then he had been in private practice in Tacoma. Surviving are his wife, three sons, and three daughters."

The 47th annual class outing was held at The Country Club of Brookline, Mass., on May 20. President Bradlee acted as host, ably assisted by Harry Young, also a member of The Country Club. The following were present: Bradlee, Dana, F. C. Holmes, Vaillant, Young, Hatch, Bowen, Punchard, Fiske, Keene, Forbes, Wilder, Brown, Blanchard, Fuller, and Read.

Rain at noon stopped in time to permit Bradlee, Fiske, and Blanchard to play 18 holes of golf on this wonderfully groomed course. Blanchard played our best ball and we won, one up, after a close and exciting match. The fact that we played 18 holes is worthy of note, Blanchard being the only one of the three who plays more or less regularly. The gang gathered together at the 19th hole from 5 P.M. on. Some talked with Barney over the phone. After an unusually fine dinner, Gorham ran through the movies of other outings and some colored movies, including some taken last summer at Williamsburg and other places in Virginia. We discussed the Alumni Athletic Fund and the recent request for additional subscriptions. Thirty-five members of the Class have subscribed, which is about 25 per cent of those listed and about 50 per cent of those still interested in Tech activities or class affairs. The average subscription is $67. The percentage subscribed is above the average, but the average subscription is less than for some other Classes of about our time, partly due perhaps to the lack of any large subscriptions.

Letters were read from George Hooper and Frank Howard. Frank had a conflict in dates, as he had a company outing in his charge the same day. It is a long time since Frank has missed one of our parties. The following sent regards and regrets: Tappan, Swan (sailing for England), Wetherbee, Moore, Dart, Ryder, Bird, H. I. Cole, Ensworth, Walker (still in Florida).

Dana, Blair, and Fiske attended the annual convention of the National Fire Protection Association at Atlantic City early in May. — Harry Bradlee's son, Junior, was married on May 14 at Locust Valley, Long Island, to Anne Marion Frothingham. — Ernest Hersame, professor of metallurgy at the University of California, is retiring from active service at the age of 70 to be professor emeritus.

F. Clouston Moore was in Brookline, Mass., during the summer with his sister. — Hartley White was married on May 29 to a Mrs. Jones of Braintree. — Gorham Dana spent his summer, as usual, at his home near Lake Sunapee, N.H. He tried to get a few of us together in July, but the weather was bad. Walter Douglass and Frank Howard, each accompanied by a daughter-in-law, had lunch with Gorham as they were up that way during the summer. — The Secretary has lost track of the recent visitors to Cohasset where Barney holds forth on lawn or piazza during the warm weather. Most of us regulars have been there at least once, and so have some of the various class families, Mrs. Moore and daughter from Hartford, Mrs. Palmer, and others. Gorham Dana called quite recently. Barney loves to have callers, and if any way connected with '91, then everything is perfect.

The following are from letters and post cards sent to Barney this summer: Charlie Hanington wrote from Denver in August: "I am wondering how you are getting on this summer. So far our weather has been perfect, only two hot days so far, 97

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degrees to 99 degrees, but on account of rarity of air at our elevation we do not feel it as you would at same temperature at sea level. Yesterday I received a fine letter from my old classmate in Brazil, F. De M. Pinto, and he asked me to give you his good wishes when I write you, which I herewith do. I also had a nice letter from Gottlieb, who has moved to Harrington, Del. The hard times hit him pretty hard, I should judge, but he is at it again and hopes to come out on top, which I am sure he will. We are having summer crowds here as a heat wave in Middle West is driving them to cool Colorado. I have hardly been out of the city this summer but hope to get off into the hills for a short rest next week."

Harry Young wrote in June: "Mrs. Young and I took a motor trip to Montreal, picking up granddaughter Jane at Bennington College and going up the west side of Vermont along Lake Champlain through Burlington and straight up, or rather, down the Richelieu River, through all the towns where the French and Indian fights went on with the earlier settlers (read 'Northwest Passage') and into Montreal. We were there two to three days and entertained so much we just had to leave and went back through Plattsburg where the officers training camp was held in 1916 and 1917. It looks just the same as it did then. We then went to Lake Placid and spent the night at Lake Placid Club, a very well run place, and then back to Bennington, Vt., across country via Lake George, Ticonderoga, and had a chance to study the Battle of Bennington. Found Battle of Bennington was not fought in Bennington at all and not even in Vermont. It was fought at Wiloomsic, about four miles over the line in New York State. It was also fought under General Starke, a New Hampshire general, with his New Hampshire regiment and by Massachusetts men from Williamsburg and vicinity. There were no New York men, very few Vermont men in this fight at all. The reason it was important was because it was first Burgoyne defeat. He had taken Ticonderoga and Saratoga and wanted to go on and take Albany and control the Hudson, but all his supplies had to come from Quebec and they were being cut off. He was too far removed from his source. He knew there were supplies and wagons for transportation being collected at Bennington, so sent a few companies with 100 Indians under Lieutenant Baume, a German. Baume was defeated, and Burgoyne, facing starvation, finally surrendered at Saratoga. Thus Bennington became a sort of second Battle of Lexington. All this was very interesting to me as I have studied so many battlefields as a sort of hobby."

Also again in August: "Just a line to let you know Mrs. Young and I are on an annual trip to France. Sail on *Statendam* this afternoon at 6 P.M. and hope it will be cooler than it is here in this hot town. We have no plans, but of course will visit the American cemetery at Romagne, and I want to see one at Bony in Belgium I have never been to. We get off at Boulogne and may go to Ostend to keep cool, motoring around from there. Steve is on an Italian boat headed for Trieste, and he goes to Vienna to a convention of electrical engineers with his nephew Sidney Withington, who reads a paper there I believe."

We have seen Harry since his return. He had a fine trip, is looking very fit. Came back on the S.S. *Normandie*, the height of luxury, but says he prefers a smaller boat. He heard from Steve Bowen while on the other side and says they treated Steve royally in Vienna.

Charlie Garrison motored to Seattle, Victoria, and back to Santa Barbara in September. On postals dated September 3 and 10 he wrote: "Our window looks out on these two peaks on the flank of Rainier. The mountain and glaciers were fine last night with the full moon upon them, and also this morning at sunrise. It was almost clear enough to see Bill Greer at the top! Mount Hood tomorrow, Mount Shasta next day, with Crater Lake." "We are now in Victoria for a week and will explore the interesting points of the Island. Then back to Tacoma for our two-day trip to Mount Rainier National Park. Clear today after smoggy days — thunder and lightning and some rain last night. One thousand five hundred and forty-three miles since leaving Santa Barbara Wednesday. Wednesday we go on an all-day boat trip among the islands." (Secretary's note: Has anyone seen or heard of Bill Greer during recent years?)

George Hooper wrote in August and September, always most interestingly: "It is some time since I have written you, but there has been little out of the ordinary to record since our 'unusual' climate has given us such a cool summer that we have not attempted any long trips. We have had thus far not over a half dozen uncomfortably hot days and but one hot night, while last week there were two evenings in which we had to light the open fireplace to avoid chilliness. By staying at home we have been able to enjoy occasional visits from our children and also to entertain and be entertained by our stay-at-home friends and also, though I suppose that Henry will delete this, to have several good bouts of cussing the government, which is an increasing pastime in these parts.

"Our young people at Hoover Dam report high temperatures there, the thermometer frequently going above 120 degrees F. Boulder City is a little cooler than that, but they have an air-cooled house so that it is possible to be comfortable indoors although any out-of-door sports are out of the question. Even bathing in Lake Mead is unattractive, as the shallow water near the shore and over the beaches reaches blood heat and therefore gives little cooling relief. I was interested to learn, however, that by a drive of but 60 miles, they can get into cold weather at an altitude of about 10,000 feet at Mount Charleston National Park in Nevada with a fine paved road all of the way and comfortable log cabins available at a low cost. This sounds like living in India and going to the Himalayas for a cool vacation. The warmth of the water in Lake Mead destroys our hopes that this reservoir might serve as a habitat for the Lake Superior whitefish which, as you doubtless know, is a great delicacy. The United States Department of Fisheries, however, has informed us that this is out of the question. Bass, pickerel and muskelunge will, however, thrive there, and it is thought that trout can be raised in the river below the dam. We are planning to make an extended trip in October to visit all of the scenic wonders of that part of the United States and get some fishing also. Our son, whose vacation has just begun, is just about arriving at his favorite fishing club on the Snake River in Idaho just a little west of the west entrance of Yellowstone Park. At this season frosts are usual in the mornings there." [The Review Editors because of restricted space have had to treat this letter as a serial and will publish the rest in the next '91 notes.]

The following changes in address have been received: George W. Chickering, 67 Stearns Street, Westwood, Mass. — Dr. Margaret E. Maltby, 430 West 116th Street, New York City. — Fred A. Cole, 1489 Culver Road, Rochester, N.Y. — Frank H. Burton, 4 Chestnut Street, Boston, Mass. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I. BARNARD CAPEN, *Assistant Secretary*, Early Convalescent Home, Cohasset, Mass.

1893

Charles V. Allen, since 1925 Treasurer of Westinghouse Electric International Company, New York City, has retired this year after 45 years' continuous service with Westinghouse interests. Immediately following his graduation in electrical engineering, he entered the apprenticeship course of the Westinghouse Electric and Manufacturing Company in June, 1893. In the following years, he passed through various departments, spending ten years at Pittsburgh. In 1900 he joined the foreign department of the company, which later became the international company noted above, and in 1903 he went to New York as sales engineer with the export department. Following his first trip to Mexico in 1904, he was transferred to Mexico City in 1905, where for 20 years he remained as the representative for Mexico of the Westinghouse interests. His work in the foreign field was not confined to Mexico, however, but at times took him to the west coast of South America. At the 30th class reunion at the Wianno Club, Cape Cod, on June 8, 1923, Mr. and Mrs. Allen were presented a silver cup for having covered the greatest distance to attend the reunion. After two decades' residence abroad the Allens were glad when, in 1925, came his permanent transfer to headquarters in New York as assistant treasurer of the International Company. That same year he was elected treasurer.

Allen married, in 1894, Miss J. Abigail Jones, and they have a son and a daughter. The son, Howard B. Allen, is a Tech

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man of the Class of 1918. Shortly after the birth of his grandson, Gale Allen, in 1925, Allen wrote: "You will note that there is a prospective Tech freshman coming along." We may yet see three generations of Tech men in one family credited to '93.

Albert Farwell Bemis was well known in Boston and elsewhere for his lifelong interest in the improvement of housing conditions through technical advances leading to lower costs of home building. This interest has now been perpetuated by the establishment of a foundation at Technology to "search for and disseminate knowledge pertaining to adequate, economical, and abundant housing." The foundation, created by a grant from the Bemis Charity Trust, will begin operations this fall with John E. Burchard '23 as director. Mr. Burchard is widely known as an authority on housing and served for many years as vice-president of Bemis Industries, Inc.

Edmund E. Blake of Saco, Maine, died on June 21 in a Portland hospital at the age of 67. Funeral services early on June 23 at Saco were followed by burial services that afternoon at Newton Center, Mass., his former home. Ned Blake was a prominent figure in the textile machinery field, both as a machinery manufacturer and as the inventor of the long-draft spinning frame. Throughout most of his professional life he was associated with but a single corporation which, during that period, developed from modest beginnings into the leading cotton machinery manufacturing company in America, with agencies in South America, Europe, and Asia — the present Saco-Lowell Shops. In this development Blake's was an important part. Shortly after his graduation with our Class from the Mechanical Engineering Course, Blake entered cotton mill engineering and for a few years was engaged in the development of cotton mills in the South with headquarters at Charlotte, N.C. In May, 1899, he was appointed selling agent for the (then) Saco and Pettee Machine Shops at Newton Upper Falls, the company which later became the well-known Saco-Lowell Shops. In 1904 he was promoted to the position of agent in charge of the company's shops at Biddeford, Maine, a position which he held until 1928 when he became the company's chief mechanical engineer. For many years he made his home at Saco, adjoining Biddeford.

An intensive worker, it was not until 1922 that Blake took his first real vacation after leaving Tech, spending that summer in Europe with his wife and two sons. In 1923 he made a trip around the world in connection with his company's export business. He was a member of the American Society of Mechanical Engineers and of the Maine Manufacturers' Association. He was a prominent citizen of Saco, for many years a member of its board of aldermen; and among other civic responsibilities he had served as president of Webber Hospital and trustee of the Sweetser Orphanage and of Thornton Academy. In 1896 Blake married Miss Clara E. Sheppard who is, herself, a Tech graduate in the Biology Course, Class of 1895. He leaves his widow, two sons, Malcolm S. Blake of Norwell and Edmund G. Blake of West Newton, Mass., and six grandchildren.

Stephen A. Breed, Associate Professor of Drawing and Descriptive Geometry, retired last June upon completion of 33 years' teaching at the Institute. Breed took his degree in mechanical engineering with the Class of 1894, after which he spent six years in his father's lumber mill and power plant at Lynn, Mass. Later he worked in the testing department of the Lynn works of the General Electric Company. In 1905 he came back to Tech as instructor in drawing and descriptive geometry. Always devoted to outdoor life and sports, for many years during the summer vacations Breed has operated the Keewaydin Camps for younger boys at Lake Dunmore, Vt. — James Albert Emery, Jr., son of our well-known classmate who is vice-president of Ford, Bacon and Davis, Inc., of New York, is a Tech graduate in civil engineering in the Class of 1938.

Edward Richard Kimball, Treasurer of the Newton Center Savings Bank of Newton, Mass., died on July 7 in his 67th year. He was one of the small group of '93 men, which included Edward B. Carney, Charles N. Cook, Frank Houghton, and Arthur G. Reed (all now deceased), who drifted into banking as their major field of work. Kimball, who had been a student of the Mechanical Engineering Course, began his active career as a stockbroker. From 1896 to 1917 he was a partner in the brokerage firm of E. R. Kimball and Company. It was in 1920 that he joined the Newton Center Savings Bank as assistant treasurer, and he had been treasurer of the bank for the past 17 years. Kimball was born in Boston, November 28, 1871. He married Miss Mabel C. Bayer in 1896, and they have one son. Kimball lived at 227 Pleasant Street, Newton Center.

The funeral of Harry Hill Thorndike, for many years a director and treasurer of the Alliance Française of Boston and Cambridge, who spent much of his life in France where he was related to the Counts of Sartiges and of Banuelos, was held April 19 at the Lindsey Memorial Chapel, Newbury Street, Boston. He died in Boston on April 16. Thorndike was born in 1868 at Newport, R.I., at the summer residence of his father, George Quincy Thorndike, Boston landscape artist. His mother was Ellen Lewis Thorndike, a member of an old Philadelphia family. Educated in his youth in France, he was later graduated from Harvard with honors in 1890. Thereupon he came to Technology and studied architecture under the late Professor Despradelle as a member of our Class, and later continued his studies in France. For a time he was in the office of Peabody and Stearns, architects, in Boston, but gave up the practice of the profession in his 30's because of an eye ailment. Thorndike served six years with the First Corps Cadets, Massachusetts National Guard. During the World War he enrolled in the officers' training battalion organized by the corps. When the United States entered the War he was commissioned a captain. He served until 1919 on the division staff of the Massachusetts State Guard as personal aide to the major general and as the secretary of the Massachusetts Military Council. Although Thorndike frequently made long visits to Europe and spent some winters in Italy, for years and until his death his home was at 175 Marlborough Street, Boston. He was a member of the Somerset Club of Boston, The Country Club of Brookline, the First Corps Cadets Veteran Association, and several clubs at Bar Harbor, Maine. He leaves a wife, the former Lucy B. Gurnee of New York, and three daughters, Mrs. Thorndike Phelps, Mrs. Charles B. Delafield of New York, and Mrs. T. Truxton Hare, Jr., of Edgemont, Pa.

Changes of address: Richard E. Belden, 1057 Ocean Avenue, New London, Conn.; Wilfred A. Clapp, 50 White Street, South Weymouth, Mass.; Professor Ervin Kenison, 24 Lake Street, Cambridge, Mass.; John I. Solomon, 121 West 87th Street, New York, N.Y. — FREDERIC H. FAY, *Secretary*, 11 Beacon Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 551 Tremont Street, Boston, Mass.

1895

Jesse Haskell Bourne, who has been associated with the faculty of the Haverhill High School, Haverhill, Mass., for the past 39 years, has resigned from the position of assistant headmaster, which he held since 1920. His resignation was effective at the end of the school year last June. Jesse is now 64 but should still be able to enjoy himself at one of his hobbies for a number of years to come. He is a native of Foxboro, Mass., and following his graduation with the Class taught at the Institute for two years and at the A. and M. College of Greensboro, N.C., until 1899, when he went to Haverhill. — Harold Gerald Fitz, now Colonel Fitz, retired, is located at 1009 Hardee Road, Coral Gables, Fla. — Ralph Norman Wheeler, I, who was living at Cocoa, Fla., passed away on May 6 this year.

The change in program at the Alumni Day banquet, June 6 last, at the Hotel Statler, from the sedate to the more jovial atmosphere of a Bohemian gathering certainly brought to the members of the Class who attended memories of boyhood days and their experiences of the Gay Nineties. The affair was a howling success. The bill of fare well covered the necessities of life, and "seconds" were available, if desired, even to the crackers and cheese. There were eight of us together: Tommy Booth, Billy Hall, Jim Humphreys, Samy Hunt, Shorty Jackson, Frank Park, Walt Williams, and Dutch Yoder. Winn Parker was scheduled to appear, but for some reason or other was absent. Frank Park, in particular, was in his best mood, and we all toasted his good health — but this was Frank's last reunion.

Franklin Atwood Park, aged 70, Vice-President and Chairman of the Board of the Singer Manufacturing Company,

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manufacturers of sewing machines, died at his summer home at Penzance Point, Woods Hole, Mass., on June 18. He was born in Taunton, Mass., January 22, 1868, son of John F. and Catherine A. (Parlow) Park. A year following graduation he married Mary Fairbanks Bosworth of Taunton, Mass. Frank was superintendent of the Baxter D. Whitney and Son Company in Winchendon, Mass., from 1896 to 1901, and then became superintendent of the Singer Manufacturing Company at South Bend, Ind., where he remained from 1901 to 1903. Subsequently he became manager of the Singer Company in Clydebank, Scotland. After leaving Scotland to return to America, the late Walter J. Rickey, a Technology classmate, succeeded Park. The latter's other business connections were the presidency of the Safe Deposit Company of New York; the vice-presidency of the Poinsett Lumber and Manufacturing Company, the Diehl Manufacturing Company, and Bourne and Company, Ltd. He had membership in the American Society of Mechanical Engineers, Society of Antiquaries of Scotland, and the following clubs: Lotos, Technology, Woods Hole Golf, and the Helensburgh Golf Club of Scotland. He leaves his widow; a daughter, Mrs. Gerard Swope, Jr., of Ossining, N.Y.; two sons, Franklin A., Jr., '34, of Westfield, N.J., and Malcolm Sewell of Mount Kisco, N.Y.; and five grandchildren.

Frank Park had a most interesting life. As we knew him at Technology, his serious mien did not do justice to his warm heart, for those who learned to know him found him a helpful friend and wise counselor. He was truly a devoted Tech man and became a life member of the Corporation in 1933. He was a generous financial contributor to his alma mater, and three years ago he gave a substantial sum toward the building of the sailing pavilion on the Charles River. As a boy he was most devoted to sailing. As a class enthusiast and in support of its finances, he was never found wanting; he gladly gave of his time, counsel, and his means. His modesty forbade publicity of his personal helpfulness to many Tech men as well as to others of his acquaintance. At the age of three score and ten, he appeared hale and hearty and actively performed his business duties as would a man of lesser years. Pneumonia claimed him within a week while he was at his summer home in Woods Hole. His passing will be mourned by many, especially by his classmates to whom he was greatly endeared. According to his wishes he was buried in the little peaceful cemetery at Hyannis, Mass., where some two years ago he had erected a small memorial chapel.

Tom and Mrs. Booth had a most enjoyable vacation trip to England this past summer — some business, of course, but mostly pleasure. They sailed from Boston on July 16 and returned on August 28, having been on English soil for 28 days. Since they had had previous experience in motoring in England, they toured the byways rather than the highways and visited sections of the coasts of North Devon, Cornwall, and South Devon. Two weeks were devoted to the motor trip, and the balance of the time was spent in London. Booth met a number of Tech men but no '95 men. His famous camera secured a number of beautiful and interesting views of the people and the country.

Harold N. Rust, Grand Secretary of Masons of the state of Pennsylvania, passed away recently. Details will be secured for the next issue. Rust's home was originally in Wilkes-Barre, Pa., but during the early part of this year he moved to Philadelphia. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

1896

Rockwell had his annual spring fishing trip to Maine the last of May and reported that the party had good luck at Moosehead Lake. Mrs. Rockwell had the record of getting a 5¼-pound fish. John and Mrs. Rockwell made the usual summer trip to Tennessee in August and an automobile trip to Canada early in September. He had the pleasure of having Amos Robinson for dinner at the time of Alumni Day, which gave them the opportunity to talk over the old athletic days of 1896. Rockwell also had a call in September from Mrs. Mark Allen as she was passing through Boston. He also learned from Fred Damon that Fred had called on Billy Anderson at Biddeford Pool, Maine, during the summer.

The Secretary spent most of the summer at work, remaining at M.I.T. until August, and then taking his work to New Hampshire through that month. In September he got away for a little automobile trip to Canada. While at the old Locke homestead in New Hampshire in August he had a pleasant surprise one day by a call from Jacobs, who was making a little automobile trip around the old stamping grounds of his youth in Portsmouth and vicinity. Mrs. Jacobs had had a long and serious siege with an infection resulting from a fall and a broken hip in March. It was nip and tuck for some time, but fortunately convalescence was progressing nicely by August.

Charlie Nevin seems to have retired, having given up his Boston office as an architect. Parenthetically, it is a question whether architects have any business these days. He and Mrs. Nevin have now become birds of passage. They went to California in November by automobile and stayed until May. They sold their old car in California and picked up a new car in Detroit on their way east. — Francis Lee, the son of our classmate Mrs. Marion Lewis Lee, is the recipient of the '96 class scholarship this year. He comes from Stanford University to take graduate work in mining at M.I.T. — Henry Jackson has finally completed the preparation of the reel of movies of our class reunion of 1936, and these are now available for any classmates who wish them and who will so advise the Secretary.

Billy Haseltine called on June 16, at the time his daughter was graduating from Smith College. He was also seeing the family off for Europe, but he went back to Wisconsin on the job. His son, William R. Haseltine, received his doctor's degree in physics at Technology in June. — Lythgoe sent a card from Italy, the end of May, reporting that he and Mrs. Lythgoe had attended the tenth International Congress of Chemistry in Rome, where he had presented a paper. From Italy they were on their way to Switzerland, Germany, Holland, and England. While in Italy they looked over Butler Ames's place, but Butler was not there. Lythgoe also sent a copy of the bulletin of the Congress, which contained a head of himself as drawn by one of the newspaper artists of the convention. Like many such drawings, it did not really give a good picture of the man. One could identify the eye glasses and the mustache. The nose was also true to life.

Attendance at Alumni Day in June included Harry Baldwin, Beaman, Callan, Damon, Davis, Dorrance and Mrs. Dorrance, Jim Driscoll, Miss Gates, Grush, Will Hedge, Locke, Pierce, Amos Robinson, Elmer Robinson, Rockwell, and Con Young. In addition, there turned up at the luncheon Laws, Tucker and Mrs. Tucker, and Guptill. The appearance of Amos Robinson was really an event, as he had made the trip all the way from far-off Texas, and this is believed to be the first time that he has participated in any class or Technology affairs since graduation. He promised to appear more frequently in the future. Arthur Baldwin was in the United States, but his schedule was such that he just could not attend the Alumni Day festivities. Lloyd Wayne had his plans all made to come to Boston as usual for the event, but he was just out of luck by having something come up at the last minute which upset his plans. Wayne is beginning his final year with the Bell Telephone system and is due for retirement at 65 next May. He has seen quite a little of Billy Andrew of late and reports that Andrew is very busy with his electric railway equipment company. Billy is just the same old fellow, although his light hair is now lighter.

Our fellows seem to be getting on the retired list rapidly. Chenery retired this year as librarian at Washington University and has gone to Los Angeles to live at 3500 West Santa Barbara Avenue. Steve Crane is also retired from the Telephone Company in New York and is residing at 300 Eleventh Avenue, Belmar, N.J. — Con Young and Abbie called on the Secretary on June 8, and gave the customary grist of news, although Con was unable to tell of any more thrilling adventures with rattlesnakes this year. The Youngs left Florida the last of April and perspired their way north in the hot weather for the first day or two, but fortunately the weather became more pleasant after that. They spent a few days with Joe Clary and his family in Washington and enjoyed the very fine culinary fare for which Joe's house is famed. — The Rev. Welles Mortimer Partridge is

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still traveling as the Mendicant Friar. The January 15 issue of *The Southern Churchman* of Richmond, Va., contains an account of him and his work, and shows him in clerical garb, with full beard, and his famous little dog, Spot.

Jim Melluish and his wife and daughter called on June 20, being in Boston over the week-end visiting Frank Hersey in Needham. Jim was very sorry that he could not get away from New York to be here on Alumni Day. — Boston newspapers, near the end of June, reported the annual flower exhibition of Charlie Gibson in his rose garden on Cliff Street in Nahant. This has come to be an important public event each year. — Joe Knight's daughter, Adeline Augusta, was married to Arthur A. Owens in Pittsfield, Mass., on June 11. The couple will reside in Silver Spring, Md.

Bakenhus has been elected president of the New York Metropolitan section of the American Society of Civil Engineers, which comprises some 2,400 members, and of which, incidentally, Charlie Trout is treasurer. Bakenhus has now become past president of the Society of American Military Engineers, having turned over his office to his successor. Bakenhus is still winning athletic trophies, having won the third prize in the veterans' three-weapon competition of the Amateur Fencers League of America. As evidence, he has a medal so inscribed. However, he naïvely states that there were only three competitors, and in attending the meet he had not the slightest idea of competing, but when only two competitors showed up he was mobbed to compete, so that with borrowed equipment and fencing clothes he made a sacrifice hit against two younger men, one of whom had been a national champion. Bakenhus actually tied five of the six bouts up to the last point and made a total of 11 hits against 16 and 18 by the other two. One sad feature of the meet was that a sneak thief got into the locker room and stole Bakenhus' purse, so that he did not have money enough even to pay the entry fee. Somewhat later he was inveigled into the New York Athletic Club Epée Championship, where he won a bout and lost three, with six points made and 11 lost.

In an interesting contribution to the *Adventure* magazine our classmate Alfred Victor Shaw, who has resided for some years in Alaska, discusses the Peary-Cook controversy over the discovery of the North Pole, telling of his personal acquaintance with each man and of his two trips on Peary expeditions. He analyzes the evidence and submits his conclusion that both men firmly believe that they actually stood at 90 degrees north. — Minor Jameson is busy in Washington with the Interstate Commerce Commission. His immediate job is the preparation of reorganization plans for some of the railroads that are in difficulties. His summer plans included a trip to Maine and Vermont, but the Secretary failed to receive any call from him in Boston.

Walter Pennell, who has settled in his old home in Exeter, N.H., since his retirement from the Bell Telephone Company, is apparently not idle by any means, but finds plenty to do and is taking an active part in civic affairs. The town of Exeter celebrated its tercentenary this last summer, and Walter was secretary of the committee in charge of the celebration. Anyone who has had to do with a secretarial office knows that it means a lot of work and responsibility. The townspeople must have felt that Walter was just the man to do a good job for them.

Floyd Frazier died on February 28, 1934, according to information recently received. We had not had any address for him for a number of years, but the Secretary hopes to be able to secure additional details and report in a later issue. — CHARLES E. LOCKE, *Secretary*, Room 8–109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1898

Another five-year period of the graduate life of our Class has passed, and our 40th reunion is a glorious memory. We owe to George Treat and Lester Gardner our heartfelt gratitude for planning and carrying out the reunion, to Ed Chapin for arranging the accommodations at the Corinthian Yacht Club, and to Elliott Barker, George Cottle, and Joe Riley — the other members of the Boston committee — each for carrying out essential parts of the general plan.

Lester has written an account of the reunion to send to all members of the Class who could not be present. We think that it should appear also in these columns: ". . . Charley Winslow, at the class dinner, as usual struck the keynote of our reunions when he said that the greatest incentive for attending was a renewal of youth. Meeting of classmates who had known each other for 44 years set back the calendar and brought to mind experiences and pleasures of many years ago. Everyone felt encouraged when Roger Babson, our oracle, predicted that in his opinion business would be better in the fall and winter and that we were going through the worst part of the depression.

"But we should go back to the beginning: The first gathering was in the Rainbow Club on top of the RCA Building, Rockefeller Center, New York City, at 10 A.M. on Friday, June 3. About eleven o'clock the party drove up the new Riverside Drive Parkway to Tarrytown to the Washington Irving Country Club. This club occupies the estate of the late William Rockefeller. The house and the grounds are of the period when money was no consideration, and the view over the Hudson is beautiful. There were 21 at the luncheon, which was served on the open veranda. Present were Bob and Mrs. Allyn and Bob, Jr., Dave Fenner, Fred and Mrs. Cutter, Allston Sargent, George Cottle, Dan Edgerly, Karl and Mrs. Waterson, Ralph Rumery, Reg Tobey, Edgar Weimer, George and Mrs. Mathews, Lester and Mrs. Gardner.

"During the afternoon two groups played golf, while others visited and swapped yarns. Reg Tobey told of his interesting experiences in China, George Cottle of his travels in all parts of the world, and George Treat of sporting life in Florida and Canada. Allston Sargent and Dan Edgerly kidded each other all through the 18 holes, to the amusement of the gallery. In the evening practically all who were at the Country Club were joined by Bob Wallace, George Anthony, Dick Brown, Fred and Mrs. Twombly, and Frank Colcord at the International Casino for dinner and the two-hour skating show. By changing seats between courses, all were able to visit with friends they had not seen for years. As those who were going to Boston had to leave early in the morning, the party broke up at about eleven.

"About three o'clock on Saturday the Corinthian Yacht Club at Marblehead Neck was a gay place. Classmates, some with their wives, were arriving, and as each new face appeared another general welcome came from all. The usual groups gathered in several rooms where Earle Emery, Bob Wallace, and Dan Edgerly had some molasses which seemed to attract flys with a '98 spirit. The class dinner was a happy gathering. Dan Edgerly, stimulated as he was with the spirits of the occasion, was a cheery toastmaster. He started the speaking by asking each of the 40 men present to tell something about his life, his job, and where he was living. All did so; Charley Wing did it twice. Then Dan called on Roger Babson to give us the low-down on the future, which he did with an optimistic forecast. Then Arthur Blanchard, our Secretary for 25 years, thanked the committee for relieving him of much of the work of the reunion. George Treat, the chairman of the reunion, offered to pay for the preparation of a classbook, and Bob Wallace offered to gather the information. Then I thanked everyone for assisting in arranging the program. Ed Chapin and Joe Riley, who looked after the New England part, were thankful that so many came. Edgar Weimer told of his work on flood control, and Paul Johnson, who drove from California to attend the reunion, brought greetings from classmates on the Pacific Coast. Charley Winslow gave one of his typical talks which mixed emotion with philosophical observations; Charles can do this so well.

"The wives of the members had a special dinner in another room in the club, and I was asked to bring them the greetings of their husbands. After dinner there were more games of bridge, festive tables in the bar, and room parties which lasted, in some cases, until dawn.

"Sunday, a bright sunny day, brought a continuation of gathering of old friends. In the evening George Cottle showed motion pictures he had taken in South America, Bali, India, and China, with his usual delightful comments. On Monday, many went to Rogers Building to hear Charley Winslow give his address, 'Farewell to Rogers.' We were all grateful that he had been selected, and afterward all agreed that he had made a most impressive speech. Treat, Edgerly, Lan-

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singh, and Gardner could not resist the temptation to visit the Chapel before going to Cambridge for the Alumni luncheon. There we had an opportunity of seeing friends from other Classes. In the afternoon some attended the Class Day exercises of '38; some saw the dedication of the new Rogers Building on Massachusetts Avenue; others enjoyed the dedication of the Davis R. Dewey Memorial Library, where Dr. Dewey said that it was exceptional for one to be present on such a 'memorial' occasion.

"In the evening at the Alumni Day banquet an experiment was tried which proved to be very successful: Dr. Compton was the only speaker and gave a report on the year's progress at M.I.T. Afterward, a magician entertained with really mystifying tricks, and old-time movies and songs kept the crowd in a happy mood until midnight. So our 40th closed with everyone happy and agreed that the four days had been delightful.

"Those present at one or more of the affairs follow: Robert S. Allyn, Mrs. Allyn, and Robert, Jr., George R. Anthony, Roger W. Babson, Elliott R. Barker and Mrs. Barker, Arthur A. Blanchard and Mrs. Blanchard, Martin Boyle, Edward S. Chapin, Frank F. Colcord, George T. Cottle, Fred B. Cutter and Mrs. Cutter, Fred B. Dawes, Maurice F. Delano and Mrs. Delano, Daniel W. Edgerly, Earle C. Emery, David C. Fenner, Lester D. Gardner and Mrs. Gardner, Charles S. Hurter, Paul F. Johnson, Mrs. Johnson, and their son-in-law and daughter, Mr. and Mrs. Bates, Carleton S. Koch, Van Rensselaer Lansingh and Mrs. Lansingh, George E. Mathews and Mrs. Mathews, Charles H. Pease, Arthur F. Porter, Henry P. Richmond, Joseph C. Riley, Amos G. Robinson, John T. Robinson and Mrs. Robinson, Ralph R. Rumery, Allston Sargent, Lewis J. Seidensticker, Mrs. Seidensticker, and Mrs. Lemon '35 (Mr. Seidensticker's daughter), Henry H. Sullivan, A. Loring Swazey, M. deKay Thompson, Reginald Tobey, George W. Treat and Roy W. Chamberlain (guest), Fred H. Twombly and Mrs. Twombly, Robert B. Wallace, Karl W. Waterson and Mrs. Waterson, Edgar A. Weimer, Paul B. Wesson, Charles F. Wing, Jr., C-E. A. Winslow, and George H. Wright."

Last March the Class Secretary was in southern California, stopping several days with Paul Johnson at Altadena, enjoying a cruise on Paul's big Diesel yacht, and taking a motor trip with Paul to Death Valley. We saw Frank and Mrs. Coombs. Frank is his old, genial self. He is now established in Los Angeles in his former line of business, *i.e.*, tile roofing. We saw Everett Curtis and W. W. Stevens at San Diego. Everett has retired from the judgeship which he held for many years and is practicing law, with headquarters in San Diego and a branch office in Los Angeles. We spent a most delightful afternoon and evening with him and his family. He has a beautiful home, high on the slope of Point Loma, overlooking San Diego Harbor. Stevens, who spent many years as architect and engineer in charge of the Standard Oil construction work in China, has retired and has built himself a home in San Diego. — We saw also Lewis Seidensticker's sister, Mrs. Hedrick, whose husband is provost of the University of California at Los Angeles.

W. R. Bonnycastle, consulting engineer on hydroelectric developments, Vancouver, B. C., is a classmate we seldom hear from, but Paul Johnson hands us a letter from him: He says he is back at the office for only a week, that for months past (last March) he had been snowed in at a mining and hydroelectric power development in the Cariboo district.

From the Montana *Standard* of May 19 we quote: "The resignation of Frederick C. Gilbert as secretary of the Mining Association of Montana was announced yesterday. . . . Mr. Gilbert, formerly of the faculty at Montana School of Mines, moved to Helena recently to accept the position of director of the Montana State Employment service. Due to the pressure of work in his new position, Gilbert found it necessary to resign his office with the mining association and also as secretary of the Montana section of the American Institute of Mining and Metallurgical Engineers. He was secretary-treasurer of the mining association since its inception in the early part of 1934 and served on many committees.

"Under his direction the only authentic mining directory of the metal mining companies and individual mines in Montana was compiled and published by the Montana Bureau of Mines and Geology in December, 1935. Mr. Gilbert also prepared a very extensive brochure on lead and zinc mining in Montana and the United States, which is being used by the State Department at Washington in its researches covering reciprocal tariff agreements with foreign nations."

The letterhead of a note received from Weimer shows the picture of some magnificent poultry and bears the legend: "Exmoor Farms, Edgar A. Weimer, Prop. All the leading varieties Land and Water Fowls. Lebanon, Pa., U.S.A. 'America's Best Blood Lines at prices within the reach of the masses.'" — The latest address of S. Fosdick Jones is Cosmopolitan Hotel, Denver, Colo. Some few years ago he retired from the active practice of medicine in Denver and went to make his home in Pasadena. — Roger Babson sailed for Germany on September 18 on the S.S. *Scythia*. Quotation from Boston *Herald:* "Asserting that American business was being held up by the European situation, Babson expressed the opinion that businessmen in this country were too pessimistic about conditions abroad. He said he intended to learn in Germany if American correspondents were working under strict censorship." Early in the summer Roger led a spectacular revolt in the Congregational Church organization at a meeting of the Massachusetts Conference and Missionary Society at Dedham. He claimed that the central organization of the society was afflicted with dry rot, and he wanted to do something about it.

We have received a number of group letters during the last year or so from Lester Gardner. The first, which has already been mentioned in this column, described his transatlantic trip in the ill-fated dirigible *Hindenburg*. Another described a thrilling air trip to Bermuda. A fairly recent letter tells of a week-end trip Lester took, starting from New York, to Seattle, thence to Yucatán, where he visited the ruins at Chichen Itzá (which he described as more impressive than the pyramids of Egypt), and back to New York by way of Havana and Miami. Another letter gives his experiences "Over the Black-Out in a Bomber," a war maneuver over Connecticut in which the attempt was made to darken the countryside, and the bomber tried to drop a bomb theoretically before the plane could be spotted by searchlights. Lester's latest communication is entitled, "Airplanes of the Future," and it is labeled as the concluding letter of his series. He had plenty of thrills in going as a "sand bag" on one of the test flights of the *DC-4*. He wrote of visits to several aircraft factories on the Pacific Coast and the marvelous new aircraft under construction therein.

Edward P. Lane, I, died last March at Brattleboro, Vt., after a long illness. His home had been in Manchester, Mass., and he had been vice-president of the Manchester Trust Company and trustee of the public library. He had been retired from his profession since 1924 but formerly he had been with the New York Central Railroad, the Elmira Bridge Company, the Boston and Maine Railroad, and Stone and Webster. — ARTHUR A. BLANCHARD, *Secretary*, Room 4-160, M.I.T., Cambridge, Mass.

1899

George A. Pennock left for London, England, on July 1 to act as manufacturing supervisor of the European manufacturing plants of the International Telephone and Telegraph Company. He wants any of the fellows who may visit London to be sure to look him up at Connaught House, 63 Aldwych. — Miles Sherrill, Ralph Loud, Burt Rickards, and Hervey Skinner represented the Class at the festivities at M.I.T. the first week in June. All reported a happy time, which was marred in retrospect, however, by the fact that Mrs. Rickards was taken critically ill near the end of the festivities and died in Brooks Hospital.

Arthur Hamilton and Mrs. Hamilton summered at Sugar Hill, N.H., resting up, Arthur said, from a strenuous trip to California last winter. He gave me no details concerning that Californian trip, and that would have been news. — Walter R. Bean is now with the Bethlehem Shipbuilding Corporation at Quincy, Mass. — Jedidiah A. Morrill is living, I hear, at 18 Summer Street, Rochester, N.H. Incidentally this is the first address I have had for Morrill for many a long year. Welcome back to the fold! — Arthur Hoxie, formerly of Auburndale, Mass., is now living at Laconia, N.H. — Edwin F. Samuels of Baltimore, Md., has

1899 Continued

written, telling me that George Dike has acquired prominence as counsel and particularly as a trial lawyer in patent cases. He has been successful in representing several large industrial corporations and is still going strong. Dike writes modestly that he has "no news," but he still practices law and serves humbly on two of the Institute's departmental visiting committees.

Haven Sawyer of Bangor, Maine, could not help me locate any of the names appearing on the list sent with my last letter and refers to them as "lost souls." He wrote glowingly, though, of Stark Newell's shipbuilding activities at Bath, Maine, where the Bath Iron Works is building torpedo boat after torpedo boat, or destroyer after destroyer (Sawyer was vague as to the type of vessel), just as fast as the five ways become vacant through launchings. For war or for peace? For offense or defense? Who knows? But Bath is booming. Uncle Sam is spending some of his tax money there.

Sawyer is chairman of the coöperative association and marketing board of the fur farming business for Maine and handles several million dollars' worth of fur sales each year. He sent me a copy of the *American National Fur and Marketing Journal*, which I have read with a great deal of interest. I think it is the first journal I have read that is devoted exclusively to furs — their production and consumption. "Truly there is more in heaven and earth than we wot of" could be aptly applied to the subject of furs. I read of furs quick and furs dead; furs wild and furs tame; research for fur farmers — its values in dollars, cents, and satisfaction.

The care and feeding of foxes is as interesting as Halliburton's talk of the "Care and Feeding of Infants," and certainly the result of a meticulous feeding program is as profitable to the fur breeder as Halliburton's nursing of the royal Tibetan baby was to him. Disease and diet of our furred friends is of more than passing interest. A diet kitchen on a fur ranch in the Spokane Valley for the care and feeding of minks is a marvel of modern convenience and utility and would put to shame the equivalent equipment of many a restaurant, hotel, hospital, or orphan asylum. Medical service for the denizens of forest and stream grows apace, and research prevents many catastrophes which, if they were permitted to occur, would make milady's winter furs even more of a luxury than they are now. — Sawyer knows his stuff. He spoke at the breeders' two-day school in New York and discussed Washington affairs, including the tariff on furs, the proposed change of the fur farmer's problem from the Bureau of Biological Survey to the Bureau of Animal Industry, Social Security, and the exemption of fur farmers from the wages and hours bills.

Edwin Sutermeister is with the S. D. Warren Paper Company, near Westbrook, Maine, and doing a good job for them as manufacturing, or industrial, chemist. — Norman Rood wrote that his daughter had won so many ribbons at horse shows this year that he couldn't list them. He told me to read the New York *Herald Tribune* and be up on the news. He is still trying, I see, to make me crib my stuff. — Replies continue to come in response to my letter to classmates, though I could wish they were more numerous. Every little helps when it comes to dues, and every little helps when it comes to news. Please read my appeal again, those who have not yet answered it. Let me have your vote on our next reunion; also news and dues. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, Northwest, Washington, D.C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1900

Just as a pleasant reminder of the Alumni Day Dinner last June, the following members of the Class sat around the table: Charlie Smith, Wastcoat, Fitch, Draper, Ziegler, Russell, Allen, and George Leach. — Since the last issue, word has been received through change of address, and so on, of the following: Mead, Graff, Barney, Charles Brown, Milton Hall, Tweedy, Carter, and Ike Osgood.

It is with sorrow that we record the following deaths, notices of which have been received during the summer: Thomas H. Minary, VI, at Louisville, Ky., on April 3; Walter Scott, II, at Reading, Mass., on June 16; and George S. Tiffany, IV, New York City, June 19. We are indebted to Professor Locke '96 of the Alumni Association, who has sent in the following: Robert H. Leach, manager and director of research of the Bridgeport plant of Handy and Harman, who was recently elected vice-president in charge of production and research of this company, sailed on April 22 on a business trip to England and the Continent.

Jim Batcheller stopped in one day this summer for a pleasant chat and wished to be remembered to all inquiring friends. He was rounding up his three sons preparatory to a long trek back to Oregon for a get-together there. He let fall the information that he takes his sabbatical year in 1939; then for some real traveling.

How far fame travels is aptly illustrated by the receipt here recently from the International Press Clipping Bureau in London of a page from the May 21 issue of *Tid Bits*, which starts in as follows: "Carleton Ellis stands today as the Master Inventor of the Age, now that the great Edison is dead. Yet how many people in this country have even heard his name? Those who visualize the greatest living inventor as being so wrapped in mechanics and chemistry as to be almost inhuman, are agreeably surprised when they meet a courteous, mild-mannered man in the middle fifties, with a high forehead and deep-set, twinkling eyes. But Ellis's mild manner masks an intense shrewdness and an energy that daily astounds his younger assistants. Probably the secret of his astonishing success is that his whole life is run on the belief that nothing is too trivial to investigate or improve. When Edison died in 1931 he had patented 1,099 inventions — easily a world record. Carleton Ellis has already to his credit a total of 1,050 patents either taken out or pending, and there is little doubt that he will easily surpass even Edison's total." The article goes on to describe Ellis' early life, his teaching at Technology, his first invention (paint remover) and some of his later ones including antiknock petrol, lipstick, cosmetics, chewing gum, soap, plastics, acetone, bone-shaped dog biscuit, and others. In the *Saturday Evening Post* of August 20, McFadyen has an article in which he mentions Ellis and the acetone invention as applied to the wings of airplanes as a fireproofing material used so extensively in the World War. Indeed the Wizard of Montclair has his place in the Hall of Fame. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

Sometimes the Editors of The Review indulge very properly their prerogative to reëdit and to cut the notes prepared by the various Class Secretaries. Furthermore, the Editors frequently make real improvements when the English used in the notes is not exactly as "she should be spoke," and we Secretaries are, of course, very appreciative of such corrections but glad that our notes are usually printed exactly as prepared. This time, however, very little class news has come in since the July Review was published, and class members will note that in the annual class letter, which was mailed on September 24 and which included a brief review of the events of the past year, special mention was made of the interesting events which occurred on Alumni Day, June 6.

Your Secretary, however, has recently received a letter from Al Higgins, whom Allan Rowe took such pleasure in referring to as the "erstwhile Strawberry King." Al expressed his regrets that he could not get North more frequently, his job as president of the Florida Power Corporation requiring that he keep pretty close to the state of Florida. Al made mention of the fact that a son of a friend of his entered Purdue University at Lafayette, Ind., this fall, and Al wanted information as to any '01 men who might be connected with that university. Unfortunately, I had to advise that our records did not indicate that any '01 men were now located in Lafayette, but if any of the class members know this to be incorrect, please advise our good friend Al at St. Petersburg, Fla. Al also referred to the fact that Florida was a wonderful place for retired members of the Class to make their homes and he offered to have the St. Petersburg Chamber of Commerce add the names of any members of the Class to its mailing list to receive literature sent out from time to time relative to the attractions of Florida. Possibly, therefore, as previously suggested in the class notes, a colony of '01 men may yet arrange to enjoy their later years in the balmy state of Florida.

1901 Continued

Joe Evans, our Vice-President, also sent in a card recently while he was on vacation at Westminster, Vt., and indicated that he hoped to stop in Hartford on his way back to Nebraska. Unfortunately your Secretary was on vacation at the time; so if Joe stopped, he did not find me in Hartford. We hope to have further news of Joe in the near future, as a recent notice from the Alumni Office indicated that his mailing address had been changed from 312 Farm Credit Building, Omaha, Neb., to 2040 Howard Street in that same city.

Two other changes of address have been received from the Alumni Office: William I. Sturtevant is now located at 150 Fowler Avenue, Pawtucket, R. I., and George L. Harris is now located at 86–10–34th Avenue, Jackson Heights, Long Island, N.Y. "86–10" is somewhat mystifying, but that is the way the Alumni Office gave the number; so it will continue to be carried on the records in that fashion unless correction is received. Two summer addresses were also received; namely, that of William G. Blauvelt, who left Florida and was at 175 Otis Street, Hingham, Mass., for the summer, and that of Allen B. McDaniel, who deserted Washington, D.C., during the summer and gave his address as Lakeland Farms, Cazenovia, N.Y.

This completes the current class news as of September 21 when these notes were sent forward to The Review Editors. We hope that the annual class letter has by this time been received safely by all members of the Class. If your comments have not already been sent forward on the data sheets, we hope you will give prompt attention thereto so that there shall be further interesting material for these notes. Furthermore, if you cannot think of anything which you believe is personally interesting (and we hope that everyone will have at least a brief comment to make about what has been happening to himself or herself), please do not hesitate to express yourself freely on any subject which you believe would prove of interest to the members of the Class. — ROGER W. WIGHT, *Secretary*, The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

Our Class made an excellent showing in attendance at Class Day, possibly due to the wish to meet once more in Huntington Hall and recall the days of Nancy Currier, Arlo Bates, and Charlie Cross. At any rate, 11 of our Class were present: Williams, Haskell, Tolman, Hunter, Robinson, Baker, Sawyer, Chalifoux, Bourneuf, Porter, and Philbrick (B.G.). After the Rogers Building exercises, the group separated, some going to their fraternities or elsewhere with old cronies for luncheon, while the remainder went to Cambridge for the buffet luncheon served in Du Pont Court, and later attended the Class Day exercises and dedication of the New Rogers. In the evening, all but Haskell and Chalifoux gathered around the class table at the Statler for the stein-on-the-table dinner, and if one can judge by appearances, it was one of the most enjoyed gatherings that Alumni Day has had.

Our Class is now in the period of its second generation and the vital statistics deal with its children. George Allen, Joe Philbrick's younger son, was married on July 23 to Dorothy Elizabeth Hose at North Arlington, N.J. On August 13, Adrian Sawyer's daughter, Florence Elizabeth, was married to Shepard Fisher Williams at Waban, Mass., and the date on which these notes were written — September 24 — was that set for the wedding of Jason Mixter's daughter, Elizabeth Elliot and Dr. H. Thomas Ballantine, Jr. This date, September 24, was that set also for the wedding of Bert Sherman's son, Robert Swift, to Carol White at Milton.

Again your Secretary would remind you that class notes are not only welcome but needed. Send them in and help keep the Class united. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

1907

A serial letter — something new for us — begins in this issue! Here's how it happens: Under date of May 18 from 5952 Cajon Boulevard, San Diego, Calif., we received the following letter from Samuel Rogers Taylor Very: "Have returned to my own country after diverse experiences in Mexico culminating in the urge to enjoy sanitation again if not sanity. Strangely, there awaited me here, evidence of your indiscretion in publication of letters, two of mine to you having been observed by somebody living in South America. First news of that; you varlet, what did you suppress?

"Real reason for this letter now is this: am contemplating a transcontinental automobile journey here to the East Coast, via Pacific seaboard to Canadian border, thence along same, thereafter southerly to a convenient stopping point next fall. It may be that hereafter the return will include digression to Mexico, or a stop in Arizona for the months in winter when this region is damp. And all this meandering whets my appetite to call en route upon favorably located classmates favorably inclined to such calls. Can you tell me whether or not there is published an up-to-date directory of such addresses? . . ."

In reply to this we sent Sam a written memorandum of nearly all the men on our mailing list and suggested that a letter describing his experiences in Mexico would be most welcome. In prompt cooperation came a ten-page letter, but as we have more material for this issue than we can use anyhow, only a part of it now appears: "Dear St. Nick, you lousy dog: If it weren't for that handsome handwriting and its evidence of the hours of slavery you put in, smiling, for us, your classmates, you'd never get a squeak out of me. But I do appreciate the splendid list you have sent me of classmates. I shall look forward to calling upon some if, as planned, I do take a transcontinental auto trip easterly this summer; so here goes with that Mexican report.

"My Mexican trip was made by boat and train chiefly and began November 3, 1937, at New York, just after my tropical blood commenced to congeal in the coldest weather I had experienced in five years; the thermometer had dropped one night to 45 degrees F. there. On the boat to New Orleans the chief events were bingo and the big apple except for a nautical scientist aboard who explained how unnecessary had been the wholesale slaughter of old of the sperm whales that used to be seen on our route; science had now cured that need, and today the few sperm whales one meets in Atlantic waters are fully sufficient, as 'their oil is renewable like their milk, daily. They drive a pipe into the blubber and pump the oil out now. You can see the old whale shrivel like a prune. Each pipe has to be changed occasionally, and the old hole plugged. The hide gets to look like a lot of walnuts.' That took us as far as 'N'Orlins,' where the darky shine boy assured me 'we runs strictly on tips, suh' and where the motorman who had promised to sing out when we reached the zoo, called 'Brakenridge Park, whar th' Politicians swings in thuh treeyuz.'

"Having passed many years since my last overnight train ride in my own country, I was curious to experience a tourist sleeper; the overnight charge in an upper was only one dollar, and next morning I shifted to a reclining-chair day coach, the most luxurious thing on wheels I had ever seen. It was one of those new streamline affairs with huge panorama windows, air purified and cooled, immaculate and wonderfully serviced, which abound nowadays in the West, perhaps East, too, so far as I know, for which there is no extra charge. What a contrast it was at San Antonio, on shifting to the 'crack' 'air-conditioned' 'flier' bound via Laredo, Monterrey, San Luis Potosí, and Querétaro for the 'City of Lakes'; it was not crack, the air was not conditioned, the 'flier' crawled, sometimes rested for hours without doing anything at all, and charged plenty for the privilege. I am a sinus victim and seek clean air when traveling; this Pullman admitted uniced air the entire route to Mexico City, and sometimes one end of the car was dimmed from the other by the dust which seeps in through those terrible mesas." (To be continued.)

Twelve '07 men enjoyed the fine luncheon and the attendant good-fellowship in the Great Court of the Institute on Alumni Day, June 6: Lawrie Allen, Ralph Hudson, Ed Lee, Frank MacGregor, Henry Martin, Stuart Miller, Ed Moreland, Bryant Nichols, O. L. Peabody, Don Robbins, Harold Wonson, and Bill Woodward. The same group met around the class table at the evening dinner and entertainment, with the exception of Hudson and Woodward and with the addition of Charlie Allen.

Frank MacGregor had arrived in the United States only a few days previously from Buenos Aires, Argentina, where he

1907 Continued

is president of Ducilo S.A. Productura de Rayon, a relatively new company and plant manufacturing rayon (see The Review, July, 1935). Frank told us that the factory is now operating successfully with about 1,000 employees, about 35 of the superintendents and executives having gone from the United States, the balance being local workers. The entire production is distributed within a distance of only about 25 miles from the plant and is paid for in cash or in notes discountable in 30 days. Lawrie Allen asked Frank if they had any salesmen or if the customers paid them to take the goods away! Mac has never married. He looked just the same as he has for 20 years: capable, prosperous, and happy.

It was good to see Stu Miller. About 15 years had elapsed since he last attended a Boston reunion of any sort, and the Secretary, who flatters himself on being able to recognize classmates quickly, did not know Stuart when he met him unexpectedly in the old Rogers Building during morning registration. Since 1921, Stu has been with the Wm. S. Merrell Company, America's oldest pharmaceutical manufacturers, in Cincinnati, Ohio, and is in charge of the packaging, printing, and alcohol and narcotic permit departments.

William L. Woodward, who retired from the steel industry a few years ago and is living with his wife on a large, delightfully located estate in South Yarmouth, Mass., has built some greenhouses on his property and is completely absorbed in experimental work in raising tomatoes without soil. He said last June that he had about 800 plants suspended with their roots in a chemical solution, which he prepares himself at very small cost. Complete control of this solution and of air conditions has produced astonishing results as to rapidity of growth and health and productivity of the plants. Bill hopes to make a commercial success of this endeavor.

Our Class may well take a good deal of pride in our showing, relative to other Classes, in the recent campaign for the Alumni Fund, although, of course, neither our total nor that of any Class was anything like what had been hoped for. The total amount subscribed as of June 30 by 79 out of 372 members of '07 was $14,252. This means that 21.2 per cent subscribed an average amount of $180.40, or $38.30 per capita. In total gifts our Class ranked third, being exceeded only by the Classes of 1897 and 1901, but each of these had one or two large contributors, so that in a ranking where individual gifts in excess of $1,000 are omitted, our Class is No. 1, with a total of $13,252, the only Class with more than $10,000. In such a ranking we are No. 3 in average subscription, with $169.90, and No. 3 in average per capita, $35.62. We had one gift of $2,000, five of $1,000, one of $600, three of $500, one of $400, three of $250, five of $200, one of $140, two of $125, sixteen of $100, one of $75, nine of $50, two of $40, ten of $25, one of $20, one of $16, eight of $10, eight of $5.00, and one of $1.00.

During last June and July we had quite extensive correspondence with Clarence R. Lamont, partly in connection with some insurance matters, but largely his letters were very personal and confiding. We can properly say, however, and with real sorrow, that for the past ten years Monty has been in miserable health, and he writes: "Last January the bottom dropped out of things for me. I collapsed physically, and among other things my sight is impaired to the extent that I am unable to see well enough to conduct any business, and my wife and I are living with my son. The doctors give me hope for a physical comeback after a long period of rest and recuperation but hold out little hope for betterment of vision." A poison in his system has practically destroyed all of his glands and muscles, so that he is totally disabled, unable to move about except with the aid of another person. His address is 1200 Roosevelt Highway, Santa Monica, Calif. He writes: "We are comfortably situated in a six-room house and have a house trailer, equipped with electrical cooking facilities as well as a gasoline stove, in which we have lived some in a trailer camp at the beach. — My son Ben, the younger one, is superintendent for the Burnett Construction Company, oil field pipe lines, and so on, near here. He is unmarried. John, the older son (30), is assistant metallurgist for the Union Carbide and Carbon Company at Niagara Falls. Is married, no children. My oldest child, Constance, is married and lives in Hallowell, Maine; has two daughters. The youngest, Alice, is married and lives in Los Angeles; no children." Fellows, I earnestly suggest that you write to Monty. Shut in, unable to work, he'll surely appreciate it. Do it now, while you think of it.

During the summer, by calls on men near Boston in person or by telephone; by perusal of many directories of cities scattered around the United States through the courtesy of Sampson and Murdock, directory publishers; and by the fine coöperation of Henry Martin in New York and Parker Dodge in Washington, we have secured quite a bit of information about several '07 men who have not furnished it themselves. Some of this follows; the rest will appear in coming issues.

Charles A. Eaton is president of Eastern Engineering Company, 4 North Carolina Avenue, North, Atlantic City, N.J., and lives with his wife at 4511 Atlantic Avenue in the same city, according to the 1938 Atlantic City directory. Eaton was an assistant in the Mechanical Engineering Department at the Institute for a year after graduation, then was lieutenant of engineers in the United States revenue cutter service for a year, lieutenant in the Coast Artillery Corps for a year, and lieutenant in the ordnance department of the Army from 1910 to 1915, when he became works manager of the Energite Explosives Company at Renfrew, Ontario, Canada. Since 1916 nothing has been known to us about his doings.

Tracy Smith, VI, is an electrical engineer with Scovill Manufacturing Company, brass mill products and manufactured goods, at Waterbury, Conn., and with his wife lives at 78 Newton Terrace in that city. — John H. Link, V, lives at Colonial Apartments, Marion, Ind., and is a teacher in the senior high school there.

After writing three times to Harry A. Frame, III, we finally received in late August a nice letter from Mrs. Frame, saying that Harry had been ill for some time and though improving could not write, so she would give the information requested. From 1907 to 1909 Harry was an apprentice with Pennsylvania Steel Company, then until 1913 an engineer with Lake Superior Corporation, when he went to Cleveland, Okla., as general superintendent for a firm called National Products Company. At present he is owner of his own business, Frame Natural Gasoline Company, manufacturers of natural gasoline, with plants in Pawnee County, Oklahoma, near Cleveland, but with business office at his home, 1539 South Yorktown Street, Tulsa, Okla. His oldest daughter, Eleanor, entered her second year at Gulf Park College, Gulfport, Miss., this fall; another daughter, Elaine, is a senior at Tulsa High School; and daughter Margaret is seven years old.

Rudolf Kudlich, II, lives at 406 Turner Street, Chevy Chase, Md. A letter received from Parker Dodge, who telephoned to Rudolf, enables us to report. Our classmate was a draftsman with Lehigh and Wilkesbarre Coal Company from 1907 to 1910, chief draftsman with Lehigh Coal and Navigation Company until 1912, then mechanical engineer with United States Bureau of Mines at Pittsburgh, Pa., where he stayed until 1920. At that time he became assistant to the chief of the technical branch of the Bureau of Mines at Washington, where he remained until the death of his chief in 1935. Then for about a year he did free-lance work at the bureau, and in 1937 was made superintendent of the Eastern Experiment Station of the Bureau of Mines at College Park, Md. (University of Maryland), his present address. He was married in 1923, and has two girls born in 1925 and 1928 and a boy born in 1931.

According to the Independence, Kansas, directory, Albert H. Donnewald is an engineer for Sinclair Refining Company, 310 West Myrtle Street, and lives with his wife, Gertrude L., at 300 North 3d Street, in Independence. No direct word has been received from Albert since 1907. — In a letter received from Harry Moody on September 6, he wrote: "I am sailing on September 28 with Mrs. Moody on the *Normandie* for a well-earned vacation. You see, my son Bob has been with General Motors Export Company since he graduated from Tech in 1934 and is now located at their German plant — the Adam Opel works at Russelsheim. I shall spend about two months in France and Germany, also Switzerland. . . . Am still with the management engineering firm of Steven-

1907 Continued

son, Jordan and Harrison, dividing my time between their New York and Cleveland offices. It is keeping me traveling a good deal, but I am used to that, you know." Harry's home address is 246 Center Avenue, New Rochelle, N.Y.

So much for now. More next time. If you find these notes interesting, please help to keep them so by sending us information regarding yourself or any other '07 man about whom you know. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

At the beginning of another year your Secretaries send their greetings to all members of the Class and bespeak your coöperation in the preparation of our class notes for the coming issues of The Review. Any clippings or notes about yourselves, your families, or other members of our Class will be gratefully received.

To pick up the thread of our activities chronologically we go back to last July and give you Molly Scharff's report on the annual sailing party held on the 16th: "I am leaving this afternoon with my family for a five weeks' vacation in California. Before leaving, however, I want to be sure to send you a brief note about the 1909 nautical reunion. All arrangements were made by Paul Wiswall who, unfortunately, was indisposed at the last moment and unable to go along. He was greatly missed, and we were all glad to learn when we got back to our offices Monday morning that he was all right again.

"On Saturday, July 16, the fleet sailed from Port Washington on Long Island Sound under the command of Admiral Dale Ellis who was host on his flagship, the sloop *Allonby*, and Vice-Admiral Lew Nisbet, who had come all the way from Portland, Maine, to see that the sextants, binnacles, and chronometers were in good order. Part of the crowd were on the cabin cruiser *Wilda* under the command of Vice-Admiral Lew Johnson, who shared honors with Dale Ellis as host. Those present included, in addition to the high officers already named, Larry Forrest, John Willard, Harry Trevithick, Harry's son, Douglas, and a pal of Douglas', Richmond Bell. Your correspondent was unable to be present on the first day.

"The fleet anchored off the Cold Spring Harbor Beach Club on Saturday night when Harry Trevithick and his crowd left the party. Your correspondent joined the fleet at Cold Spring Harbor on Sunday morning, July 17, and we had a grand sail on a beautiful sunshiny day back to Port Washington, arriving in the late afternoon. En route, luncheon was served, consisting principally of the Cornish pasties that Mrs. Trevithick had made and which were left over from Saturday. They were delicious. There was also a plentiful supply of beer on ice which Lew Nisbet had commandeered at Cold Spring Harbor. On our arrival in Manhasset Bay in the late afternoon we had a swim and then were served a delicious five-course dinner by Lew Johnson on board the *Wilda*. A good time was had by all.

"The only other thing to report is that your correspondent received a severe sunburn from which he is only now recovering. I might add, also, that when I arrived at Cold Spring Harbor I asked the old captain who operates the harbor motorboat whether he had seen any of the crew of the *Allonby* on shore, and he said 'I don't know, but there were a couple of middle-aged men down here a while ago looking for ice.' I knew he was talking about Lew Nisbet right away. Admiral Dale Ellis has designated the *Allonby* as headquarters on the water for 1909, and Lew Nisbet has promised to come down from Portland to help sail the boat up to Oyster Harbors."

And speaking of Oyster Harbors, next year will be our 30th anniversary, for which reservations have already been made at the Oyster Harbors Club for June 3 to 5, 1939. About the first of the year we will be getting plans under way; so if you have any new ideas, send them along.

John Willard's outfit is resuming its previous practice as management engineers and accountants, under the original firm name of Bigelow, Kent, Willard and Company, with offices in Boston and New York. — Among the employer members of the committee to fix textile wage standards is John Nickerson, representing Cheney Brothers, silk manufacturers of South Manchester, Conn., and New York City. — Bob Doane, who was formerly employed by the Anaconda Wire and Cable Company, is now engaged in doing utility valuation work for the New York State Electric and Gas Company, an Associated Gas and Electric subsidiary, and is working on the lines all over the state trying to find out for the benefit of the Public Service Commission what the plants are worth.

The sympathy of the Class goes out to Chet Dawes, whose wife passed away suddenly last September at their summer home in Boothbay Harbor, Maine. Many of us have pleasant remembrances of Anna's attendance at our class reunions. She was also John Davis' sister. — At the Fifth International Congress of Applied Mechanics, held in Cambridge, Mass., September 12 to 16, Mayo Hersey presented a paper on the "Thermal Equilibrium in Journal Bearings." — Miss Ruth O. Pierson is city bacteriologist in the health department of East Orange, N.J.

And now coming to the next generation: Davis R. Dewey, 2d, Brad's boy, was graduated from Harvard College last June. — Royce and Victoria Gilbert have announced the engagement of their daughter, Doris, to John M. Hitchcock of Newton Center. Miss Gilbert is a graduate of the Beaver Country Day School and Wellesley College and since her graduation has been studying drama with her uncle, Clayton D. Gilbert, at the New England Conservatory of Music. Mr. Hitchcock is a graduate of the University of Hawaii and the M.I.T. — Charles. T. Main, 2d, and Samuel F. Main, sons of Charlie and Rose Main, were graduated from Dartmouth College with the Class of 1938. — Captain and Mrs. Charles C. Baldwin of Freeport, Long Island, have announced the engagement of their daughter, Cynthia, to Samuel F. Main. Miss Baldwin was graduated from Smith College this June. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries:* PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

The Alumni Day dinner held in June was one of the most interesting affairs ever given by Technology. Your Secretary was disappointed that there were so few of the Class there to enjoy the festivities. Those present were Karl Fernstrom, Jack Babcock, Bob Burnett, Roy Briggs, Cliffe Waldo, Alfred Phillips, and your Secretary. As a guest at the 1910 table we had Phillips' son, Daniel '38.

Luther Davis, who is chemist for Haffenreffer and Company, announces the marriage of his daughter to E. T. Haslam of Council Grove, Kansas. — Charlie Greene, now associated with the firm of which your Secretary is a member, announces that his oldest daughter is now training at the Massachusetts General Hospital; his second daughter has just entered Mount Holyoke College; and his third daughter is making a name for herself in the various tournaments held at the Longwood Cricket Club in Brookline.

E. L. Patch, commander in the United States Navy, writes that he is being transferred from Pearl Harbor, T.H., to duty in the Army Industrial College, Washington, D.C. — Last year Roy Briggs spent two months in Hawaii and finished the season in Florida. Roy now maintains a residence in Belmont, Mass. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

Once again your Secretary accepted the invitation of the Technology Christian Association to attend the annual subfreshman week-end and teach the boys of 1942 Tech songs and cheers. Before leaving I received a note from Roger Loud, VI, to be on the lookout for his second son, who entered the Institute this fall. Next month I'll have a story for you of my experiences.

At the 1938 Alumni Day, June 6, we exceeded by one our mystical 11 Eleveners, for there were 12 of us at lunch in the Great Court that day. Of this number the following seven also attended the stein-on-the-table dinner at the Hotel Statler, Boston, that evening: George Cumings, VI, Dennie Denison, VI, Jack Herlihy, II, Henry Martin, I, Morris Omansky, V, O. W. Stewart, I, and Alec Yereance, I. Those attending the lunch and afternoon activities in Cambridge, but not the dinner, included George Cowee, III, Monk de Florez, II, A. V. deForest, XIII,

1911 Continued

Thorne Wheeler, X, and Al Wilson, I. Monk and Al each had a son in the graduating class in the Course in Engineering Administration, mechanical option: Peter de Florez and Albert O. Wilson, Jr.

The Farewell to Rogers ceremony was one of the most impressive events of the day, and as an '11 man it seemed almost impossible for me to realize that 27 years have passed since we received our degrees in dear old Huntington Hall. At the Class Day program in the afternoon in Lowell Court, the 25-year class address was given by Larry Hart '13, an old friend of many of us, who is now general sales manager of Johns-Manville Sales Corporation, with offices in New York. Larry paid particular tribute to the Class of 1911 for the help we gave the Class of 1913 when we were juniors and they were freshmen. Another particularly impressive event for us was the dedication of the Davis R. Dewey Memorial Library.

A signal honor came to one of our number on June 1 when Rufus E. Zimmerman, IX, Vice-President of research and technology, United States Steel Corporation, received the degree of doctor of science from Franklin and Marshall College at that college's commencement exercises in Lancaster, Pa. Heinie was graduated from Franklin and Marshall with a Ph.B. degree in 1908 and then received an S.B. with us. After three years on the M.I.T. instructing staff, he joined the staff of American Sheet and Tin Plate Company in Pittsburgh as research associate in 1914, and after succeeding to various research and operating positions in the ensuing years, he became vice-president in charge of metallurgy and research of Big Steel in 1933 and on January 1 of this year was appointed a director, member of the executive committee, and vice-president in charge of research and technology. He is also a term member of the M.I.T. Corporation. For this new honor, as for all others so well deserved, hearty congratulations, Heinie! In a mid-June letter, acknowledging my note of congratulation, Zim said he had just returned from the Vassar Commencement, where he and his wife attended the graduation of their daughter, Anne. "This explains in part," he wrote, "why I could not be with you in Boston on Alumni Day. Franklin and Marshall and Vassar were obligatory this time; Tech will have the call next year. Incidentally, I met some M.I.T. fathers at Poughkeepsie, but no Eleveners."

Just as summer was bidding adieu to us here in Massachusetts on primary day, a bright spot appeared for me in the person of Gardner C. George, I, chief engineer of the New York Power and Light Corporation, Albany, N.Y., one of the three divisions of the Niagara Hudson Corporation which supplies all the power of Upper New York State, except that of the city of Rochester. Gard and his wife had just left their daughter at Northampton, where she is entering her junior year at Smith, and, en route to a stay at a Cape Cod resort, stopped off here in Worcester just for the fine renewal of acquaintance we had. For many years after graduation Gard stuck to hydroelectric work, first in the Southwest and also in Mexico and eventually in Watertown, N.Y. Since transferring to Albany, however, he has really become an electrical engineer instead of a civil, and he believes it a great tribute to M.I.T. that the training the Institute gives in any specified line of engineering permits one to transfer to another branch of engineering so readily.

Ten-year-old Stanford H. Hartshorn, Jr., son of Stan and Jule Hartshorn of Gardner, Mass., brought fame to the name of Hartshorn at this year's National Soap Box Derby. Young Stan won the event held in his home city and then went on to the finals to set a new world speed record (28.66) for homemade soapbox cars on the 1,182-foot sloping Derby Downs track at Akron, Ohio, finishing in third place in the finals. Upon his return in late August, he was tendered a banquet by the Gardner Rotary Club. Fine work, Stan! Another junior Elevener brought joy to his dad and mother this summer when Richard Robinson, youngest son of Mr. and Mrs. Harold Robinson of Worcester, was graduated from Wilbraham Academy. In the Denison family our daughter, Helen Elizabeth, 17, was graduated from Worcester South High School last June and is doing a year's postgraduate work at Worcester Classical High School, while her big brother is starting his sophomore year at Bowdoin and young George is in Woodland Prep, here in Worcester.

In June one of the fine old grads — Captain Nathanael G. Herreshoff '70 — died at Bristol, R.I. In acknowledgment of a note of sympathy, his son and our classmate, Sidney, XIII, wrote: "Father's achievements were beyond anything that our generation can hope to attain, but I have two little boys who already show a great liking for boats, and I guess the chief interest of Mrs. Herreshoff and me is to bring these little fellows up to follow in the footsteps of their grandfather. I am still with the Herreshoff Manufacturing Company, attending to the designing and engineering."

With much regret I record the death on August 24 of Whitford Drake, Commander, United States Navy, retired, one of our XIII-A grads. At the time of his death he was president of Electric Research Products, Inc., with offices in New York City.

In midsummer we learned from Charlie Locke '96, Alumni Secretary, that Jim Greenan, III, for several years consulting engineering for Marsman and Company, operating in the Philippines, and manager of that company's southern division, has returned to the United States with his family. You can reach him at Box 172, Carmel, Calif.

Early this summer I had a nice note from Harry Tisdale, V, American Dyewood Company, 100 East 42d Street, New York City, expressing regret at his inability to attend Alumni Day this year. After evincing surprise at Pete White's procrastination in popping the question, Harry added: "Grace and I took a long trip down as far as Atlanta, Ga., last spring, mostly business but some pleasure. Covered 2,700 miles in 12 days. Saw the Shenandoah Caverns, Natural Bridge, Smoky Mountain National Park, Lookout Mountain, and Stone Mountain. The peach trees were all in bloom in Georgia when we were there. On the way back we saw Sam Hayes, V, at Charlotte, S.C. July 1 we go camping up to North Hudson, Essex County, N.Y., for a couple of weeks and then back to business. I hear from Joe and Rose Harrington in Chicago, and they see the Jim Duffys frequently."

It is nice to learn that Alanson Palmer, V, is now president of the Technology Club of Central Ohio, his address being 83 East Schreyer Place, Columbus. Other new addresses received through the summer from the Alumni Office include the following: Kester Barr, II, Goodloe Moore and Company, 603 North Gilbert Street, Danville, Ill.; Conor W. B. Coppinger, 820 18th Street, Northwest, Washington, D.C.; Burgess Darrow, VI, Yellow Creek Road, R. D. No. 7, Akron, Ohio; Waldemar R. Diaz, VI, Coronel Pringls City, Argentina Republic, South America; Carl G. Richmond, I, 185 Argonne Drive, Kenmore, N.Y.; Alexander W. Yereance, 62 Otis Street, Newtonville, Mass.

So ends the first set of notes of the current volume. *You* know how best to insure a continuation of interesting notes — that's it, write to Dennie! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1913

Some Tech Classes are reunion minded. Nineteen thirteen was not one of them, that is, prior to June 4, 1938. There is something epic about a 25-year reunion. Looking forward to ours last winter, the class officers felt that its success would be in direct proportion to the size of the attendance. Right away we drafted Bill Mattson, our genius for this sort of thing, and Bill proceeded to take the reunion to town. I feel sorry for those of you who missed the event — a hilarious, yet soul-satisfying occasion.

In the first place, we broke the Institute record for 25-year class attendance, with 139 at the Saturday luncheon, 112 classmates at the Saturday night class dinner, 165 at Joe Cohen's all-day Sunday party at the Kernwood Country Club, Salem, and to wind it up 91 classmates at the Alumni Dinner Monday night at the Statler in Boston.

Bill Mattson and his committee had a job on their hands when they started to work early in the year. They faced entrenched class lethargy and the depression. What a fight they made, and how they succeeded! Some succeeding class may break our attendance records, but none can pack more enjoyment in three short days than we did. That this is true was by no means a matter of luck; Bill and his men had planned it that way.

1913 Continued

From the moment we registered at the Commander Hotel in Cambridge until we filed out of the Statler ballroom at midnight on Monday, everything that could contribute to make a great reunion had been ordered with consummate skill. Mabel Mattson and her co-workers had done a painstaking job for the complete entertainment of wives and children, and let me assure you that their attendance in large numbers was a real contribution to our enjoyment. As an example of the careful planning, take the registration. Upon opening our envelope we each pulled out a small, felt lapel banner, black letters on orange ground, inscribed, "M.I.T., 1913, 25th Reunion." Together with this were an indentification pin, an orange and black reunion sticker for our rear car windows, a souvenir program of events, and, finally, a large-scale map of the route from the Commander Hotel, Cambridge, to the Kernwood Country Club, Salem. This is a sample of the kind of stewardship that we had all the way through.

A small contingent arrived at the Commander Hotel on Friday night, June 3, but registration began in earnest late Saturday morning. Joe MacKinnon had two experts on this job, which was handled as smooth as velvet. By one o'clock the hotel lobby was alive with smiling, babbling classmates, proud fathers, happy wives, attractive children, and our four bachelors. It took some minutes to herd this gay, chattering assembly to the luncheon room. As we entered this room we found the west wall pretty well covered with 1913 memorabilia: newspaper clippings, pictures, dance programs, and what not. On the wall back of the toastmaster's chair hung an oil portrait of an attractive young lady. Bill Mattson presided. Presiding is Bill's meat, and he does it to the queen's taste. I don't remember what he said, but it was short and sweet. The young folks enjoyed the food; their elders seemed to pay most attention to conversation. On behalf of the Class there were presentations: to Mabel Mattson, a silver platter; to Bill, a medallion, with Tech seal and inscription; to Pa and Mrs. Ready, a reproduction of the baby picture of our class baby, Neva Marie. This picture was the one which appeared in "Technique," and the Readys had lost the original through accident. Then up jumped Bill, and while pointing to the portrait on the wall back of him, presented its original in the very comely young matron, our own Neva Marie. Then with the words, "You haven't seen nothin' yet," he introduced Neva Marie, 2d, our class grand baby — a winsome, dark-eyed, six-year-old miniature of her mother.

Later in the afternoon Buttsy Bryant showed movies of our 15th reunion at Chatham and of the M.I.T. 1930 general reunion at Squantum. After the movies we gathered for the official reunion picture, which includes some 144 faces — a merry, fine-looking group. Meanwhile, of course, much back slapping and reminiscing were going on — the meaty part of any reunion. The ladies and children were shepherded to Boston for dinner at the Fox and Hounds Club and entertainment at the Pops concert in the evening. It was natural that we should expect the class dinner that night to be the big event of the reunion, and without Joe Cohen it would have been. However, in itself, it was a grand party, with food, song, fellowship, music, and entertainment. Our professor at the Institute, Arthur Townsend, was toastmaster, and at that job he packs no mean talent. The only sad note was Arthur's reading of the list of 66 names of classmates who have passed on. Our speaker was genial Professor Prescott '94, who told us of the major changes at Technology in the last 25 years. The talk was a gracious, interesting one. An able orchestra played during the evening. Charlie Thompson put much pep into the cheers, and he did his best to get good fellows to make good songs ring clear. After dinner two saucy girls, not unduly hampered by clothing, entertained the boys with songs and dances. We got wires of greeting from the Classes of '88 at Marblehead and '03 at Saybrook. Incidentally, it rained all day and far into the evening, but who cared! Miles Langley and others held open house in their hotel rooms during the wee hours of Sunday morning.

Sunday at Salem exceeded all expectations. Abundant transportation and the convenient map included with registration papers made it easy to reach the Kernwood Country Club, where Joe Cohen was host for the day. The country club grounds are beautiful, and the clubhouse — the former residence of Colonel Peabody — is a gem in a charming setting. The weatherman was kind, on the whole. We had bursts of sunshine, and it actually rained only a few minutes, during dinner, when it didn't matter.

One hundred and sixty-five classmates and families attended. Joe had installed a private bar for us in the dining room to whet the appetite for a bountiful and tasty buffet luncheon. Following lunch the party split up in groups for the afternoon, for sight-seeing in the very historic neighborhood, and what not, but of course most men played golf. Some 55 entered the kickers' handicap, for which Joe offered three prizes, each a dozen golf balls. Low gross prize went to Ed Hurst, high to Bob Bonney, and the prize drawn from a hat went to Karl Briel. The scores were not important.

The after-golf and before-dinner gathering in the locker room was a rare treat in the mellowest of fellowship. Joe was the perfect host on this unforgettable occasion. It was a merry troupe which filed into the dining room to join the women, children, and celibates. After a broiled-steak dinner which several gourmets (very rare among our trenchermen) pronounced excellent, Bill Mattson presented Mrs. Cohen with a bouquet of roses and Joe with an attractive guest book, suitably inscribed and containing the signature of each of the day's guests. Joe and Mrs. Cohen got rousing "We are Happys," and we were ready to call it a perfect day, but Joe was not through. He had provided an entertainer, a slick young prestidigitator. This lad was good — in repertoire, execution, and patter. In addition he took care of himself in an exchange of badinage with Nate Poor. In the parlance of *The Tech* reporter: "Steward Cohen outdid himself, and a good time was had by all."

"Came the dawn" Monday, with sunshine. A goodly number went to Rogers in the morning for the symposium on the impact of science on the arts. A few of our more sensitive natures like Bill Brewster felt, to put it in Bill's pithy language, "unequal to the shock of this impact" and so avoided it. We had a large attendance at the buffet luncheon in the Great Court on the Institute grounds. Our next scheduled pleasure was the opportunity to attend Senior Class Day outdoor exercises and listen to Larry Hart's speech to the youngsters. Larry's speech, bristling with "personality plus five" and enlivened with good stories was in proper taste for the occasion, and his appearance did both himself and '13 proud.

The wind-up came at the Alumni Dinner at the Statler. I presume that the committee in charge this year had in mind the gathering of some 90-odd '13 men, discriminating gentlemen all. At any rate, this stodgy fixture was all tinseled up for the first time. The locale was that of the roaring Nineties. In front of the entrance wall was erected a false front which depicted an old-fashioned brick-front block with its ubiquitous saloon. This bit of the scene painter's art, with the clever illumination, gave a startling illusion of a gas-lighted street in the old days. Inside, we sat down to red and white checkered tablecloths, with some 500 other Alumni to fill this ballroom and enjoy a dinner of corned beef and cabbage and beer. We put all the pent-up decibels of 25 years into "We are Happys" and regular "M.I.T.'s" until hoarseness cut us down. The dinner program was excellent, but it paled somewhat because our cup of joy had previously run over.

Some high lights: The man most changed in appearance: Kin Dey, XV, our lithesome cross-country runner, who now has the enviable aspect of J. P. Morgan; a close second: Miles Langley, I, who, too, has attained a bankerlike presence. Least changed man: hard to say, but Charlie Thompson has put on no weight, still moves like a panther, and has most of his hair, which is jet black. Most ebullient: Phil Capen, X, retains his boyish figure and roguish manner. Youngest looking wife (is my neck way out!) in splendid competition, Mrs. Miles Langley. Most beautiful wife: Professor Swain advised one class of his graduating civil engineers to "Be bold, be bold, be not too bold." So, for this answer, consult Farwell, Trull, or Morton — bachelors, all.

The man who, Gene Macdonald said at first glance, has fulfilled *his* promise: Lester Gustin, I, weight then 200 pounds, weight now estimated roughly at exceeding 22 stone. Best dancer: Henry Milton

1913 Continued

Caswell, who gets the award by his impromptu performance with one of the glamour girls at the Saturday night dinner. Best storyteller: Professor Arthur Lawrence Townsend, II, S.B. Man from greatest distance: Harold Crawford, IV, from Walla Walla, Wash. Loudest article of wearing apparel: Dave Nason, XIV, and Bob Bonney, X, were tied — a Minnesota lumberman's plaid shirt versus a Jersey City slicker's violent red one. Longest holdout: old Hap Peck, II, who made up his mind at nine o'clock Saturday morning to be with us, and was he glad. Best land pilot: the daughter of Ed Cameron, I. Ed was in good hands at Joe Cohen's dinner. Only tennis players: Gene Macdonald, I, and Dick Cross, VI, who fought it out at Salem, winner not reported. Dick lived in Paris so long that he has trouble with the English language.

So end my lucubrations (a word from the rich vocabulary of Arlo Bates) to tell the story of the 25th reunion of the Class of 1913. May we live and prosper to enjoy our 50th. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

1914

Writing about Alumni Day events for publication five months after the facts seems more like ancient history than news. Nevertheless, some of the Class were unable to attend, and for the benefit of these absentees a few words are in order. With the accumulated experience of each Alumni Day there has been a steady improvement in the program. The outstanding, new feature this year was the wholehearted way in which 1913 carried out their part as the specially honored 25-year class. As we will occupy that unique position next June, we can well give attention to the things in 1913's planning which brought about their marked success. One important point for this particular reunion was the inclusion of wives and children in many of the events and the holding of several of the events actually in Cambridge, using one of the new hotels as headquarters. A committee will soon be formed to plan for our reunion, and your ideas will be welcomed by that committee. Send them to any of your class officers, and they will see that they are properly presented.

But to get back to last June. A very enthusiastic group of '14 men was present, and in addition to the regular events we held our own preprandial party at the Hotel Statler late in the afternoon of Alumni Day. The number of out-of-towners who attended was gratifying. Captain Richey, United States Navy, came from his post at the Brooklyn Navy Yard; Malcolm Mackenzie came from Derry, N.H.; Leigh S. Hall, from Concord, N.H.; Art Peaslee, from Hartford, Conn.; Herman Affel from New York; Dinney Chatfield from Hartford, Conn.; F. A. Ralton from Lawrence, Mass.; and Buck Dorrance from Camden, N.J. Greater Boston residents attending were Corney, des Granges, Crocker, H. S. Wilkins, Morrison, Atwood, Fales, Hamilton, and Richmond. Our honorary members, Professor Millard and William Jackson, were also present.

Jim Reber and his 16-year-old son, Bill, paid your Secretary a most pleasant visit during August. Jim, who is vice-president of the Columbian Rope Company at Auburn, N.Y., was visiting in Massachusetts and took the occasion to show his son through Technology, where the latter is planning to enter two years from this fall. Bill Reber will become one of a group of at least 20 sons of '14 men who are already at Technology or who plan to enter within the next two years.

Herman Affel (whose son is now a Technology sophomore) continues to keep the Patent Office busy with his inventions. His latest patent covers an electrical frequency converter. Howard Morrison (whose son is likewise a Technology sophomore) is busy supervising the erection in Cambridge of a new seven-story office building for Lever Brothers Company, with which he is associated. Boggs has for his architect our own classmate, Donald des Granges. How many of you know that Boggs is a gentleman farmer? New Boston, N.H., is the location, and Boggs insists he is nearly prepared for a self-sufficiency existence when the collapse predicted by the pessimists appears. For real self-sufficiency, however, we have to turn to Norman MacLeod, whose Green Pastures Farm at Kenyon, R.I., is being run on such a real engineering basis that, according to latest reports, it not only operates on a self-sufficiency basis but goes way over into the capitalistic profit system class.

In mid-September there was held at Technology and Harvard the Fifth International Congress for Applied Mechanics. Here gathered distinguished scientists from all over the world. One of the events of the congress was the dedication of the new Wright Brothers Memorial Wind Tunnel and occupying a prominent place in the speaking program was Charles H. Chatfield, now in charge of research of the United Aircraft Corporation. While on the subject of honors in the field of science, we call your attention to the fact that Roger Williams received an honorary degree of doctor of science last June from West Virginia University. Williams is chemical director of the ammonia department of the E. I. du Pont Company at Wilmington, Del. — Writings by classmates which have recently come to your Secretary's attention include an article by J. W. Horton in the August *Electronics*, entitled "An Electronic Cardiotachometer," and a book on structural design (Wiley) of which H. L. Bowman is coauthor.

Frank Ahern is back at the Interior Building in Washington, D.C., after a three months' trip, covering 13,000 miles, inspecting the government's national parks. His trip included the Grand Canyon, Yosemite, the several parks on the Pacific Coast, and so on, and Frank draws pay for this kind of work! Perhaps some work is involved because the Washington *Post* on September 13, in noting his return to Washington, calls attention to the fact that in addition to being chief of the safety division of the National Park Service, he is also chairman of the Federal Interdepartmental Safety Council and chairman of the Committee on Health and Safety appointed by the Secretary of the Interior.

In 1924, Stirling Harper set the class record by being the first to be the father of five children. He soon had to share honors with Donald Douglas and with Bob Murphy. Murphy, who is managing director of the United Towns Electric Company at St. John's, Newfoundland, has just brought his class records up to date and hereby challenges anyone to claim his title as being the most fatherly man of the Class. For evidence he presents his record: "Marie, 1918; Regina, 1920; John, 1922; Robert, 1923; Barbara, 1925; Paul, 1927; Janet, 1929; Judith, 1933; and David, 1937." Bob hopes to be present next June when we celebrate our 25th and will be prepared to receive the credentials of all challengers. In the meantime your Secretary salutes the challenger as the victor, because the class records show no other contestant yet beyond the five class. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

1915

Greetings to all you classmates as we open our column in this new volume of The Review. However, it is sad to recall the passing of our classmate and dear friend, Robert E. Haylett, who died on June 13 at the Good Samaritan Hospital, Los Angeles, Calif., after a brief illness. Bob hadn't been well for a number of years and two years ago underwent an operation for appendicitis which apparently did not locate his difficulty. He became ill while in New York and left there on June 2. He arrived in Los Angeles on June 5, when his condition was pronounced serious but not dangerous. Apparently matters became acute, as he died suddenly the following Monday. According to the doctor's statement, Bob had been suffering from an intestinal infection for 10 or 15 years. He went with the Union Oil Company in February, 1916, and was employed in the research department at Oleum, Calif. His progress was rapid, and he became manager of research, assistant to the vice-president, and then director of manufacturing. During the early part of 1938 he was made a member of the board of directors of the company. His death was a great shock to all his associates and friends, as he was well known in the oil industry, and his loss is keenly felt.

I obtained the foregoing from Bob's obituary from the June 14 issue of the Los Angeles *Times* and a letter from his secretary, Miss Louise Lackner. Raymond Stringfield supplemented this with the information that he attended Bob's funeral, which was quiet and beautiful, with flowers from several of the 1915 men who were unable to attend. For our Class I wrote a letter to Mrs. Haylett,

1915 Continued

and I know we all join her with our sincere sympathy in her loss. Bob was a popular undergraduate and always could be relied on in the later years for generous and loyal support of all class activities. The honors and responsibilities that Bob had in the oil industry must have been a reward for his friendly interest, sound judgment, and far-sighted planning ability.

Raymond Stringfield wrote further, interestingly, that he hopes to get back in 1940 for our 25th reunion. He says his children are rank Westerners who have never been farther east than Akron, Ohio, and that only when they were small, so they are about due to be educated a little. He says also: "Have seen Bill Mellema, Ken Kahn, Elwin Norberg, and Dave Hughes in recent weeks. All seem normal. Norberg spends about seven nights a week on Masonic work and his days as architect for the Los Angeles Board of Education. His wife, Lottie, who was a high school classmate of mine, must be unusually good natured."

Whom have I seen this summer? At a week-end in Sunapee, N.H., Mrs. Howlett and Weare, Mrs. Wechsler and Al (1921 but 1915 by adoption), some other friends of ours, and I visited Herb and Mrs. Swift at their place, "Windy Acres," in New London, N.H. There's no use my trying to describe the beautiful place they have; you'd simply have to see it to appreciate it. Suffice it to say, we had a delightful visit, with an enjoyable lunch in the village. Herb has a pet goat on the place, which we attempted to ride in lodge-initiation style. Herb took movies of these stunts, so perhaps he'll show them to us next winter. I met Peter Masucci at the Institute this summer. He is taking one of the advanced colloidal chemical courses — hasn't changed a bit and is very much of a scientist. He'll be on hand for our 25th reunion.

In answer to a letter from Charlie Locke '96, Alumni Secretary, our Class has gone on record as being willing to make a financial contribution toward a tangible memorial of the Rogers Building in the buildings at Cambridge. This should be a nice way to preserve the fond memories of Rogers and our associations there.

On June 6 the Class gave a cocktail party at the Hotel Statler preceding the Alumni Dinner. As a sign of oncoming age we departed from our usual stag custom and invited the ladies. A few showed up, and I am sure they were well pleased and will come again. I hope more ladies will be present at next year's party. There isn't much I can tell you about this affair. You just have to be there to know about it and enjoy it. Fred Waters brought a couple of older Tech men, a Mr. Robertson and Mr. Sullivan, and Wally Pike brought his business associate, A. H. Varney. Including these, the following were there (it may be that in the fog of the finale I missed a few names): Gabe and Mrs. Hilton, Weare and Mrs. Howlett, Abe and Mrs. Hamburg, Al ('21) and Pearl Wechsler, Harry Murphy and his favorite aunt, Herb Swift, Frank Scully, Charlie Norton, Azel Mack, George Rooney, Frank Murphy, Louie Young, Peter Munn, Fred Waters, Whit Brown, Archie Morrison, Bert Adams, Max Woythaler, Waldo Pike, Jason Hancock O'Brien (Johnny to us), Barney Landers, Ben Hurvitz, and Carl Wood. Henry Damon '08 dropped in to visit.

In order to help the Alumni Office find the latest address for John Kelleher, I wrote to Wayne Bradley, who was always so friendly with Johnny. His letter, following, is typical of Wayne's sincerity and humor: "I have not seen John Kelleher since 1931, when I looked him up in Brooklyn, N.Y. At that time he was working for the Brooklyn *Eagle* but was planning to go South. I haven't heard from him since. Last spring I met Frank Wall on the train, but he hadn't seen or heard from Johnny for years before that. Please make proper note of my new address: Griffin Avenue, Bridgeport, Conn. I have bought a new house, or at least I will have bought it 20 years from now if my job holds out, and the old ticker keeps on working. It's a real nice place, a Cape Codder with six rooms, all electric — range, dishwasher, garbage disposal, oil burner, and so on. The only things we have to do are eat, sleep, and pay for the contraptions. Now, more than ever, you must stop and see what my inattention to old Doc Talbot is starting to provide (23 years late). I travel a good deal, but I'll be home this summer, and if you are in this neck of the woods, bring your bathing suit, as we have a lake in our back yard. I will post my wife as to what a 'no good' you are, and she will know what to tell you if you call up when I am not home (personally, the good secretary doesn't know just how to take that). At any rate, there will be a welcome on the mat if we can get hold of a mat before you arrive. I am devoting the next page to a map showing how to arrive at the Bradley wigwam. Hope to see you soon." There follows a map not drawn to scale but pretty good for a Course V man, and I hope pretty soon to take advantage of Wayne's invitation.

From probably the best customer the airplanes have came a letter from Jerry Coldwell at Paradise Valley, Wash. Jerry wrote: "It really is a vacation this time — two months of it — the first one in nearly four years. We visit all of the western national parks, Lake Louise, and Banff." This, coming from Jerry, reminds you of the well-known gag about the taxi chauffeur taking a ride on his day off. — This is a pretty good start for our first column. It's continuance depends on your contributions (literary). Help Azel! — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline, Mass.

1916

John R. Freeman, Jr., has been appointed technical manager of the American Brass Company, Waterbury, Conn. — Walt Binger has again broken into print in connection with the new East River drive in New York City. Perhaps by the time we have our next reunion, reunioning members may be able to drive on this new highway. — The New York Building Congress golf outing was held on June 14 at the Westchester Country Club, and Dick Ahearn of the Western Waterproofing Company donated one of the prizes.

Tom Holden of New York City was elected a director of the Merchants' Association of New York at the annual meeting of members held in May. — Charlie Reed, captain in the United States Army, who was stationed in Washington for four years, was moved to Springfield, Mass., in September and is now living in the government quarters at the Springfield Armory. Charlie is holding several jobs, including that of chief armory inspector, fire marshal, safety officer, and athletic officer. He says that Course II prepared him for the first three jobs, and Frank Kanaly for the last! Charlie's wife and twin boys, aged 13, are with him at the armory. His oldest boy is going to Millards Preparatory School in Washington this year and hopes to go to West Point next year.

Bill Barrett made an extended trip to California during the month of September. Your Secretary will contact him later in the hope of getting some news for The Review. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Dick Lyons is reported as being production manager of Tydol now with offices at Houston, Texas, and responsibilities that take him into several states. Ed Aldrin has resigned from Standard Oil of New Jersey and is now engaged in consulting work. He has recently returned from Europe and has been engaged on special investigations. We believe he includes well-known shipping companies among his clients. Ed has also been named to the advisory board of the Association of Men with Wings, national organization of prominent aviators who are working for the return of the original Wright Brothers airplane from England. C. A. Clarke '21 was good enough to forward a clipping from the Newark *Evening News* in which a Kirschbaum "Sky Figures" cartoon illustrated the high lights of Major Aldrin's career. They include his first flight in 1918; jumping in a self-packed parachute in 1920; world's record for amphibians, 1935; first American businessman to fly his own plane abroad; made commendatore of the Crown of Italy for assisting mass flight of Italian squadron; nine years president of the Daniel Guggenheim Medal Fund, and so on. A little note at the bottom adds: "His citations would fill this sheet!"

Like father, like son: The new American record for tuna was posted early in August with credit to Ben Crowninshield of Boston and Harrison Eddy of Dedham. Bill's boy handled the cruiser *Honker* during the hour and 55 minutes

1917 Continued

required to subdue the 710-pound fish. He has been nominated for honorary membership in the Gulf Coast Backlash Associates of Texas, and his father automatically becomes eligible for the Old Men's Auxiliary.

Bill Hunter, who was once in suspenders but more recently in cotton goods, dropped in during the summer to discuss his tentative plans for the future in the field of textile merchandising. — Stanley C. Dunning has also changed his activities and has transferred his base of operations to Boston. He is now sales manager of the New England Whiting Company and vice-president in charge of sales for the West Coast Kalsomine Company of Louisiana. West Coast Kalsomine manufactures water paints and related materials, selling exclusively through manufacturers and wholesalers. It has plants located at Seattle and in California and Louisiana as well as East Boston. Stan wrote recently: "I have another member for the '1917 Paint and Allied Products Gang.' The other night at the New York Paint, Varnish and Lacquer Association annual meeting it was my privilege to introduce to the gathering Phil Rowe, who is president of the United States Shellac Importers Association.

"Phil and I had not seen each other since 1917, and it certainly was a happy happenstance to get together again. We recognized each other, so I guess we haven't changed too much. Phil's course in mining engineering certainly must have been good preparation for his going into the shellac business. Altogether, he has spent some ten years in India, so knows the shellac game from the ground up. I understand that he is an importer of crude shellac. With Penn Brooks now in charge of all of Sears, Roebuck's manufacturing plants, he can qualify for the 1917 Paint and Allied Products Gang, for Sears, Roebuck are sizable manufacturers of paints, but before electing Penn we will have to look into his qualifications a little further."

Neal Tourtellotte writes his eastern representative that he has been honored by election as one of the trustees for the Seattle Arboretum under the auspices of the University of Washington. Neal's new responsibility covers about the same area as the Arnold Arboretum in Boston, and the trustees hope that it will eventually occupy a similar position on the West Coast. He has also been appointed by the Governor to the advisory board of the division of the blind, Social Security Department, state of Washington, and subsequently elected chairman. The committee has charge of work for the blind, including direct relief, prevention, and rehabilitation. The state of Washington considers itself unusually progressive in work for the blind and particularly successful with its rehabilitation program in which it leads the nation. Trained teachers have made many of the blind self-supporting, independent citizens, holding constructive industrial positions. Neal writes: "In our own shops the variety of products they are making is marvelous. I can see one of my particular hobbies is going to be lining up a merchandising campaign for these products. We are going on the basis that the products they manufacture must be sold in competitive markets without favoritism and sell on their own merits."

Joseph Gargan was married on June 1 at St. Mary's Church, Brookline. His bride's maiden name was Elizabeth McCormack, and we had to depend on a former member of the three musketeers, Bob Erb, for even this meager bit of information. — Dennie not only worries about filling his own column for the Class of 1911, but catches and sends clippings to other Secretaries from time to time. Early in the summer he informed us that Harold Stewart had had his appendix out and that he and Mrs. Stewart won low gross from among 80 players at the tourney at the Worcester Country Club in July. We are also responsible to Dennie for the information about Ed Aldrin already mentioned. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1918

In a lather of excitement Hanley, A. F. Howard, Tom Kelly, Marshall, Ray Miller, Gretchen, Richards, and Carlton Tucker attended Alumni Day and loudly bruised each other after the manner of men who would be boys again. But the real jail break from the here and now was on June 24 when the lads gathered at Weekapaug to celebrate our 20th reunion.

Relaxing in the perspective of a 60-day interval, the neurotic internal disorders of preparing for that jail break seem funnier than they did at the time. I have direct testimony to the effect that it was imperative for the committee to get in touch with Harold Weber one night. His name was not in the telephone book. Information said he did have a phone, but it was one of those private numbers which even wild camels couldn't drag out of a loyal operator. Would the chief operator call him and see if he would talk to us? Definitely, *no!* Unless some Aladdin could rub the old lamp and smuggle the number to us, the company would do nothing. Alas, we knew no official of the company to sound a loud timbrel for us. Maybe Gretchen's mother would know the number. So we called her in Milton, but the conquering legion of the years had made the exasperated voice of a badly wilted committeeman difficult for her to understand over a contraption like the telephone where confused disjointedness resulted. Maybe Gretchen knew. The idea inflamed us instantly. So we called her in Darien, Conn. Harold's number — in case you're interested — is Hyde Park 0972, but don't rely on this. When he reads these notes, he'll have it changed. Why do some people have a telephone anyway?

So we gathered at Weekapaug. Stuart Boyd and Ray Miller came in trailers, Don Goss accompanying the latter as supercargo. "Where are you going, dad?" sez the Goss hopeful. "To be a boy again, son," sez the inimitable Don. Al Howard, whose twin brother was right behind him, tried to introduce Ira Young as his next of kin to Sax Fletcher. "I remember the name, but the face gives me a little trouble," was a pleasant variation on the old bromide. E. G. Betts couldn't come, but sent in his claim for the class baby — 19 months old last June 3. Bill Foster had his plans all made, but instead of just being a boy again, he went childish and had the chicken pox, while the New Jersey mosquitoes conducted their annual war games around his tousled head. Phil Dinkins sent regrets at the last moment, and Jim Flint never did explain why he didn't show up.

But here's the roster, reading from top to bottom of the hotel register: Gretchen Palmer, Ralph and Mrs. Mahony, Yale and Mrs. Evelev, Tom and Mrs. Kelly, A. F. Howard, Ray Miller, Al and Mrs. Sawyer, Don Goss, D. H. Montgomery, Henry H. Mardoian, Byron Cleveland, P. S. Shelton, Everett and Mrs. Rowe, Pete and Mrs. Sanger, Mr. and Mrs. Halfacre, Bill and Mrs. Wills, Harold and Mrs. Weber, Anna Eales, Jack Hanley, Alexander and Mrs. Magoun, E. A. Mead, Mike and Mrs. Flett, G. S. Gould, Jack and Mrs. Kennard, Granville Smith (looking even more glamorous than ever), Bill and Mrs. Neuberg, Ned and Mrs. Longley, Walt and Mrs. Robertson, Pete and Mrs. Harrall, Mr. and Mrs. A. C. Walker, Tom and Mrs. Brosnahan, Art Windle, Nat Krass, Herb Polleys, Ira Young, Paul Howard, Sax and Mrs. Fletcher, Bob and Mrs. Van Kirk (who came 1,000 miles and consequently deserved two lobsters at the banquet), and Walter and Mrs. Biggar.

The weather was excellent and so was the food. Even the carrots were good, and there's no excuse for that. And there were those who noted the impressive improvement of Scotch since prohibition was repealed.

Ned Longley upheld his reputation for being the most gentlemanly, because with a golf score of 126, he still smiled. Ray Miller chalked up 143 strokes, but an insurance agent has to be a bad golfer. Al Howard miraculously won the low gross, the low net, and the kickers' handicap, but with the New Deal crusade against monopoly, he got only one of the silver cups. The kickers' handicap went to Al Walker, and the other prize was a tie between Pete Harrall and Montgomery. Mrs. Evelev, Mrs. Halfacre, and Mrs. Kelly were all tied for low gross on the distaff side, and Mrs. Evelev won the kickers' handicap. Don Goss received the soft-boiled egg because he made a birdie for the first time in his life. He celebrated this distinction by loudly dipping into the troubadour's domain with a strangely diverting and sassy ditty which went like this: "You may be a guy who wears glass in his eye, with an LL. or Ph.D.; you may lecture to ladies or give students the Hades, but you're just plain Maggie to me!" — Wretch!

1918 Continued

When Tom Kelly began his throat-sore announcements with so singularly cryptic a salutation as "fellow athletes!" everybody knew that the big cup for tennis had been won by Granny Smith. Bill Wills took home the second prize, but nearly required crutches for several days. It was nip and tuck between Mrs. Rowe and Mrs. Harrall in the ladies' match, but Mrs. Rowe finally landed first prize. At the bridge table Mrs. Walker came out first, Mrs. Sawyer second, with the booby prizes going to Walt Robertson and Mrs. Halfacre. There was a contest of horseshoe pitching — someone having thoughtfully first removed the horse. Tom Kelly came out ahead by a worn calk, but there wasn't much competition, Maggie Magoun being runner-up.

At the banquet on Saturday evening, where all of us were resplendent in the pert cardinal-and-gray caps Pete Sanger had secured, the irrepressible Goss awarded the degree of U.B. (unclaimed blessing) to Our Gretchen. Pete Harrall, Treasurer, reported that the Class had a balance on hand of $17.68 in the Wellesley National Bank. How much we have at Radcliffe was not divulged.

It is with an irrepressible pang of regret that I chronicle the election. For a full decade it has been my bright and precious opportunity to tweak ears and to discomfort the uppity through these columns. There have even been those who were generous enough to read these ink-stained pages. But it is to be no more. The boys elected me president, an office which I neither desired nor deserved. It was as class secretary that I was unquenchably happy. But to prolong the lovely, lost sensation, this opportunity has been given me to thank you for the joys of the last ten years. Perhaps when I am sufficiently toothless and decayed, the Class will once more allow me to sign myself, F. ALEXANDER MAGOUN, *Secretary*. But during that interlude, it will be: — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1920

The long summer hiatus brings as usual a grist of news, some of which will be ancient history to many of you, but since it hasn't been recorded in these notes, it is offered without further apology. With great regret I must report the untimely death of William Harold G. Moy on August 13. Colonel Moy was formerly known as the Mayor of Chinatown, Boston, and his passing was mourned by members of the Chinese race throughout the world. He leaves two sons, one a former student at M.I.T.

It is a great pleasure to mention the marriage of John Donald Mitsch on July 9 to Miss Frances McFaul, daughter of Mrs. Alexander Daniel McFaul and the late Judge McFaul of Machias, Maine. Mrs. Mitsch is a graduate of the Vesper George School of Fine and Industrial Arts in Boston. The couple stayed in Machias, where Don has been teaching at the Tech Summer School, and will make their home in Boston. — Charles J. Muller has left the Oliver Mining Company to become assistant to Thomas Moses, Vice-President of the United States Steel Corporation of Delaware. — Henry W. Erickson has returned to the Allis-Chalmers Manufacturing Company of Milwaukee, the sales division.

Donald Williamson is with the Asphalt Institute at 609 Southwest Life Building, Dallas, Texas. Frank Bradley's present address is 355 Meadowbrook Avenue, Ridgewood, N.J. Ted Best has recently moved to Brookline, 111 Davis Avenue. Bill Welch has left these parts and is now located in East Providence, R.I., 151 Taunton Avenue. Bob Tirrell has left Germany and is back in Brockton, Mass., 270 Spring Street. Arthur Radasch is now living in Upper Montclair, N.J., 3 Windemere Road. Frank Maconi's new address is 21 Winthrop Road, Belmont. Ed Bragg has returned East and is now in Scarsdale, N.Y., at the Cragswell Apartments. Ken Akers' present address is 88 Garland Road, Newton. Stan Bragdon has moved from Westbrook, Maine, to South Milwaukee, Wis., 609 North Chicago Avenue. Eric Etherington is with the Tucker, Anthony and Company, 120 Broadway, New York City. Archie Cochran is with the Reynolds Metals Company, Richmond, Va. Livingston Wright is way out in Alaska with the University of Alaska. Hank Couch may be reached at 34 Lakeview Park, Rochester, N.Y. Larry Boyden is in Winnetka, Ill., at 215 Cherry Street. Henry Murphy, formerly of Asia Minor and more recently of Hartford, Conn., is now in Riverdale on Hudson. Archie Kinghorn is now at 7 Lucerne Avenue, South Fort Mitchell, Ky. Ed Burdell, as many of you know, has left the Institute to become director of the Cooper Union in New York City, a man-sized job. Bat Thresher, as you all should know, is director of admissions at the Institute, a good thing to remember if you have a son coming along.

A miniature but exceedingly select reunion was held at the Winchester Country Club late in August, the party consisting of Jim Gibson, Buck Clark, Perk Bugbee, and your Secretary. It is a pleasure to report that the twins took on Gibson and Clark at golf and gave them a sound beating. Never mind asking the scores. — Your Secretary wasn't very faithful to his task last season but promises to get in notes regularly this season, provided he receives assurance that they are being looked at. Will you, therefore, make the small effort and investment necessary to send me a post card saying that you have read these notes and wish me to carry on? If at the same time you will give me a trifle of news, I shall be more than repaid. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

Once again, the annual welcome to the series of monthly meetings in these columns after the summer pause. In resuming activities, thanks are due those who have been so helpful in communicating items during the last few months. Your Secretaries look forward to a continuance of this generous assistance during the remainder of the season.

To bring the class narrative up to date, it should be recorded that Alumni Day on June 6 — and everybody agrees it was the best of the new series of yearly celebrations — offered 11 of the Class an opportunity for an unusually good get-together. For sheer fun and good-fellowship, the Gay Nineties banquet surpassed anything yet done along that line, thanks to the activities of our own Warrie Norton, Fritz Ferdinand, and Larcom Randall of the committee in charge. Besides these three, Ellie and Wally Adams, Mich Bawden, Profit-and-Loss Hanson, Mel Jenney, Chick Kurth, Slide Rule, and Cac Clarke also partook of corned beef and cabbage at Dinty Moore's. They helped revive the old custom of accompanying the "Stein Song" with practical gestures involving working models of appropriate containers brimful of the customary P.O.N. (H'ya, Bill Rose!) As a matter of fact, only Warrie's stein was on the table much of the time. He had to sit at the head table and maintain such dignity as the occasion demanded.

Larcom Randall was also celebrating the first birthday of his daughter, Alice. Big brothers Larcom, Jr., and Donn are now respectively 11 and nine years old. Daddy sells superior printing done by T. O. Metcalf and Company of Boston. It was good to see Mich Bawden again after a lapse of many years. He is New England manager of the Dexter Folder Company. — C. Harry R. Johnson is with the Raybestos-Manhattan paper division, in charge of their experimental paper mill in Manchester, Conn., where he lives at 27 Scarborough Road. Prior to taking up his present work a year and a half ago, Harry was general superintendent of the Peninsular Paper Company, Ypsilanti, Mich. Harry has also been associated with the Downington Manufacturing Company, Downington, Pa., and had been executive engineer of Scott Paper Company, Chester, Pa., and chief engineer of Beckett Paper Company, Hamilton, Ohio. He is married and has two daughters: Norma, 11 years, and Harriet, nine years old. — Arnold C. Rood recently stopped in to see Saint en route to Boston from Delaware, where he and his wife had been vacationing with their three children. Ace lives in Wellesley, Mass., and has been a patent lawyer with United Shoe Machinery Corporation, 140 Federal Street, Boston, for many years.

Manchester, Conn., is very much in the news this month with another interesting item. During the summer, Ray St. Laurent and Saul Silverstein were made vice-presidents, respectively in charge of sales and production, for the Rogers Paper Manufacturing Company. Ray's ability in the paper and plastics field is excelled only by his wife's preëminence as the perfect hostess. On the side, Ray has a successful silver fox raising enterprise, located in Nova Scotia. Saul has been associated with Rogers since 1928, first

1921 Continued

as a consultant with Bigelow, Kent, Willard, following which he joined Rogers in 1930. He lives at 39 Stephen Street, Manchester, and has three fine children, a boy and two girls. Ray and Slivers are both directors of an affiliate company, Bakelite-Rogers, Inc.

Our sincere sympathy to Chick Kurth and Charlie Herty on the passing of their fathers and to Dick Spitz on the loss of his infant son. — A welcome telephone call came from Howard LeFevre who is now with United States Smelting Lead Refining, Inc., 57 William Street, New York City. Moose promised to lunch with us in Newark soon and report on his doings since the 1931 reunion. — A note from Perley B. Kimball gives his new address as 179 Woodward Avenue, Rutherford, N.J. Kim said he'll deliver a more elaborate statement to us in person at the November 18 meeting of the Newark Club.

A few of the many changes of address during the summer include: Arthur N. Brambach, VI, XV, International Business Corporation, 25 Battery Street, San Francisco, Calif.; Christopher C. Carven, IV, 48–56 Forty-seventh Street, Woodside, Lond Island, N.Y.; Dr. Ivan F. Chambers, X, 509 Lore Avenue, Wilmington, Del.; James B. Ford, XIII, Post Office Box 1034, Palos Verdes Estates, Calif.; Robert B. Frost, X, 625 East Washington Street, Greencastle, Ind.; Daniel M. MacNeil, III, 104 Eliot Avenue, West Newton, Mass.; Lieutenant Colonel Alfred B. Quinton, II, Office of Chief of Ordnance, Room 3069, Munitions Building, Washington, D.C.; Armistead L. Wellford, VI, Appalachian Electric Power Company, Bluefield, W.Va.

Other recent address changes have been received for the following: J. Henri Bayle, II, Farrell Manufacturing Company, 804 Cass Street, Joliet, Ill.; Captain Harold O. Bixby, II, Signal Corps, Manila, P.I.; Edward P. Clark, II, 191 Cedar Street, Chepiwanoxet, Warwick, R.I.; Herbert C. DeStaebler, XV, 460 North Taylor Avenue, Kirkwood, Mo.; Harold D. Griswold, XV, 10 Green Street, Slatersville, R.I.; William B. McGorum, II, Lehigh Valley Transit Company, Allentown, Pa.; A. T. Eric Smith, I, Canadian Industries, Ltd., Box 10, Montreal, P.Q., Canada; Christopher B. Nelson, XIII, Box 26, Annapolis, Md.; Thomas W. Proctor, I, Perryman, Md.

It wouldn't be Thanksgiving without turkey. Your Secretaries would like theirs garnished with news from all of you. Start doing your good deed today. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

1922

Alumni Day in June was the occasion for a partial reunion which we are sure would have been thoroughly enjoyed by many others if they had been present. Keep this in mind for next year. The banquet surprisingly enough was a very robust affair, and the steins on the 1922 table were filled and emptied with commendable frequency. Present were Berry, Chittick, Fales, Warren Ferguson, Whit Ferguson, Godard, Grover, Marvin, and Tonon, and as the banquet progressed Marjorie Pierce forsook her alumnae companions at a neighboring table for the conviviality of 1922.

Prime financial news of the summer in the New York papers was the election of Al Browning to the presidency of United Wall Paper Factories, Inc., the country's largest manufacturer of wallpaper with a number of plants in the East and Middlewest. — Ken Merriam has been promoted to the rank of full professor of aeronautical engineering at Worcester Polytechnic Institute. — Joseph Randall has been made principal of the Emerson School in Newton Upper Falls. — R. M. Kasch has been made director of the industrial engineering division of the National Conservation Bureau of the Association of Casualty and Surety Executives, a position which appears "conservative" in everything except the length of the title.

It is with deep regret that we report the death of Sanford Leland at Darien, Conn., on September 15. Leland was a sales executive of the Texas Company. We extend the condolences of the Class to his family. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company of New York, Inc., 303 West 10th Street, New York, N.Y. C. YARDLEY CHITTICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

1923

A report on the reunion is forthcoming; I have Pete Pennypacker's word for it. He did a fine job in running the affair last June, but told me he had to let the preparation of the projected report go till fall. It may be out as soon as these notes appear and will be sent to all of those attending the reunion as well as those who sent in the two-dollar class dues to help the work of getting the party started. Thanks are due to the even 100 persons who sent in the requested dues. I got a lot of material that can be worked into future issues of these class notes, and I hope eventually to give a report on what all those who responded are doing. For this month a word or two of dope on the reunion will use up most of the space I feel The Review Editors will stand for this time.

There were about 60 in all who showed up at Riversea Inn, Old Saybrook, Conn., to enjoy the week-end. The program was fine. We played golf and tennis, and Chan Clapp staged a treasure hunt which was a lot of fun in spite of some rain that day. The rain also helped the indoor sports, such as bridge and the inevitable bull sessions. One of my own vivid recollections of the party is a picture of Dave Skinner trying to assemble one of the electric mixers (his company, General Electric, makes the darn things) which he had brought along as a prize. With their attachments, these mixers are supposed to be a boon for overworked housewives, but Dave didn't get the thing together until he had consulted the instruction book.

Another picture of the party, one which maybe others will share, is the memory of the foghorns, just off the shore, which didn't let up for the three days. Miles Pennybacker memorialized this and other features of the reunion in a slightly befuddled verse which we regret we cannot print.

The following list which I trust is complete for the sake of the record (but in which there may be omissions) contains the names of those present at Old Saybrook or at Technology on Alumni Day or at the all-Technology dinner at the Statler the evening of Alumni Day: Alan Allen, W. P. Allis, Fred Almquist, Art Belyea, Horatio Bond, Jim Brackett, George Bricker, John Burchard, Charlie Burke, Clarence Chaisson, Shorty Chamberlin, Chan Clapp, W. E. R. Covell, Roger Cutting, Walt Dietz, Tom Drew, Gerald Fitzgerald, Dick Frazier, H. B. Golding, Bill Greenough, Stubby Griswold, Frank Haven, Herb Hayden, Bob Hershey, Frank Hobson, Penn Howland, Harry Kalker (and Mrs. Kalker), Andy Keppel, Herb Leisk, Bill LaLonde, Walt Marder, Burt McKittrick, J. J. Murphy, A. S. Myers, Miles Pennybacker, Pete Pennypacker, A. M. Perkins, Bernie Proctor, Al Redway, Jim Robbins, Tom Rounds, E. C. Rue, Howard Russell, Dave Skinner, Doc Smith, F. P. Squibb, Ed Thimme, Atherton Thomas, Lem Tremaine, Roy C. Wagner, D. E. Washburn, A. B. Whitehouse, Archie Williams, E. W. Willis, Bill Wise, and Jack Zimmerman (quiet!!). — Because of serious illness of his parents, Bob Shaw was unfortunately prevented from being on hand after having made all plans to attend.

One of those who graciously chipped in dues to help along the reunion was Rosalie Cobb, whom the New York *Times* recently listed as an outstanding woman chemist. Miss Cobb is a lithographing technician and research chemist for the Lowe Paper Company of Ridgefield, N.J., and a well-known authority on industrial colloids. As an interesting footnote to the reunion she wrote on June 19 that things had been moving a little too fast at just that time for her to take advantage of the invitation to the reunion. Just a few days before, the story broke in the newspapers that she had been married since November 25, 1936, to Vladimir Karapetoff, Columbia University professor. Miss Cobb is a direct descendant of Miles Standish and granddaughter of one of the founders of Tufts College. Since leaving Technology she had done research work for Larkin Company in Buffalo and the United States Bureau of Standards in Washington. She is a well-known figure in the technical association of the pulp and paper industry. Professor Karapetoff was born in St. Petersburg, Russia. His mother was one of the first medically trained women in Russia. He is a graduate of the Imperial Institute of Ways of Communication and the Darmstadt Polytechnic Institute. Coming to this country

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in 1902 he remained to become one of the country's leading electrical engineers and professor of electrical engineering at Cornell since 1904. He is a lieutenant commander in the Naval Reserve. He is well known for his work on high-power circuits and in higher mathematics, and has honorary degrees in engineering and music. The marriage announcement came as the couple were setting out to travel extensively during the summer, Professor Karapetoff enjoying a sabbatical leave. They will make their home in New York City.

Raymond P. Harold, President of Worcester Co-operative Federal Savings and Loan Association, sailed in September to attend the sixth International Congress of Building and Loan Societies in Zurich, Switzerland. He will devote some time also to studying the post-War building program in England. This item is obtained through the courtesy of O. B. Denison '11. — The Boston *Post* says that announcement has been made of the marriage of Anne Theresa Johnson of Arlington, Mass., to Allard M. Valentine of Auburndale, Mass. The wedding took place in New York. — Francis Minot is mentioned in the Boston *Evening Transcript* as one of those establishing the Boston Dry Dock Corporation which is constructing in Chelsea a shipyard equipped for major repairs on any sized ship in the coastwise service and for topside work on ocean liners. The project will employ 500 to 1,000 men.

Gilbert N. Reed announces the removal of his law office to 527 58th Street, Brooklyn, N.Y. — Note that your Secretary has a new address. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Munroe Road, Quincy, Mass.

1924

Received too late for our notes in the July issue, news of the death of Robert W. Tracy, formerly associated with the De Vilbiss Company in Toledo, is reported here with deep regret.

From the July issue of *VI-A News* (whose source was *Electrical Engineering*) we learn that: "J. T. Lusignan, Jr., has been appointed executive engineer of the Ohio Brass Company, Mansfield, Ohio. Formerly engineering assistant to the vice-president, he will now supervise all engineering activities of the company. At the completion of his course at the Institute, Mr. Lusignan enrolled in the graduate school of Stanford University and received the degree of Doctor of Philosophy in Electrical Engineering in 1928. During 1925–26 he was research assistant in the high-voltage laboratories of the General Electric at Pittsfield. He was with the G.E. until 1930 when he became transmission engineer for the Ohio Brass Company."

Lloyd Westbrook was married recently to Miss Jane Preston of New Canaan, Conn. Westbrook is an architect, and his bride attended the Todhunter School in New York and the Low-Heywood School in Stamford, Conn., according to the New York *Times*. — Married at Irwin, Pa., on June 11 was Bob Daily, whose bride is the former Miss Mary Duncan, a graduate of Indiana State Teachers College and of Penn State. — Oscar B. Pratt, now a selectman of Strafford, N.H., was married in June to Miss Pearl H. Reeves of East Rochester, N.H., a graduate of the McIntosh business school in Dover, N.H., we learned from the Boston *Globe*.

Selectman Pratt is not the only member of the Class known in politics. From the New York *Sun* comes this clipping: "David Lasser, president of the Workers Alliance, lets it be known that the WPA will heed Aubrey Williams's advice to 'keep our friends in power.' The alliance, says Mr. Lasser, will head into the forthcoming elections and swing 2,000,000 votes. The slight, dark, hesitant Mr. Lasser, a graduate of the Massachusetts Institute of Technology, was president of the Interplanetary Society, shooting rockets at the moon. As an engineer, he believed in the engineering mind and voted for Herbert Hoover. Professing disillusionment, he became the national leader of the unemployed, leading them in various marches on State capitols. There are certain dispirited persons who see in the unemployed millions an 'extra-economic' society, with Mr. Lasser as its leader. He is 37 years old, a native of Baltimore, now rating himself as a Socialist of the Norman Thomas wing."

John T. Blake, Cambridge chemical research director and editor of "Chemistry and Technology of Rubber," presented two papers before the Institution of the Rubber Industry of England in London last summer. He is also the developer of a process for preserving rubber on undersea cables. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1925

Having survived the big wind in September with nothing more serious than a disconnected telephone, your Secretary hereby presents the all too brief annals of the summer doings of the Class, mostly in the nature of adjourned business from our last meeting. C. E. Locke '96 sends the following notation, completing the story on the Bateman odyssey: "Glen L. Bateman of Edward L. Bateman, Dorr-Oliver representatives in South Africa, sailed on May 18 for London, England. His sailing completed a three months' stay devoted to the review of latest United States manufacturing methods and to the inspection of leading metallurgical mills and sanitary treatment plants."

I received a letter from Doc Foster, Assistant Secretary, early in the month, which read as follows: "Ever since the Alumni Day last June I've been going to send you word as to who of the Class attended the banquet. Three faculty members were present, namely, H. T. Mann, III, Associate Professor of Petroleum, S. H. Caldwell, VI-A, Assistant Professor of Electrical Engineering, and myself. There were three other men, namely Robert E. Huthsteiner, II, who is still located in Allentown, Pa., so far as I know; Gilbert W. Noble, XII, assistant professor of petroleum engineering at the Missouri School of Mines; and Rufus N. Palmer, XIV, now with the Mellon Institute in Pittsburgh. Palmer received his Sc.D. in ceramics on the day following the reunion."

Count Blonsky is still unable to remain in one place very long. His last remove was from San Francisco to Rocky Bar, Idaho. — Jim Creveling, after being in Birmingham, Ala., subsequent to his stay in South America, has now gone with the American Smelting and Refining Company at Charcas, San Luis, Potosí, Mexico. — Frank Fricker, the best distance runner of the Class, is still in Birmingham, Mich., on Yorkshire Road, Route No. 3. — Another whose wanderings seem to match those of Blonsky is George MacDuff, who is now with the Jamaica Public Service Company, Ltd., Kingston, Jamaica, British West Indies, his former address having been Canaria, in the Canary Islands. — Alex Ulmann, IX-B, is now connected with the Aviation Equipment and Export outfit in New York City. — Freddy Walker has moved to the suburbs, having left the city of Niagara Falls, N.Y., to live in Lewiston, N.Y., some ten miles away. — HOLLIS F. WARE, *General Secretary*, 17 Green Road, Medford, Mass. F. LEROY FOSTER, *Assistant Secretary*, Room 6–202, M.I.T., Cambridge, Mass.

1926

The announcements of two births grace our class notes folder this month: that of Carl Anton Müller on September 7 to Dorothy and Theodor Müller and that of Deborah Taylor on June 18 to Gladys and Flint Taylor. — Too late to be recorded last spring was the marriage of Bill Meehan to Evelyn Barrett on June 17. Bill is assistant to the president of the New England division of the Great Atlantic and Pacific Tea Company, and he and his bride are living at 11 Russell Road, East Dedham, Mass.

The Secretary regrets to report the death on June 24 of Samuel Bryden, Jr. Bryden's career was very courageous, however tragic. After graduating with our Class he was stricken by infantile paralysis in 1927, but this disability did not prevent him from subsequently taking an advanced degree and becoming a research assistant at the Institute. After leaving this assistantship he set up an optical company in Waltham, Mass., and became an optical consulting engineer. After he was disabled the Secretary had a number of letters from him, and he always took a genuine interest in the Class despite the fact that he was restricted in the extent to which he could participate in its activities.

Other *varia* and *trivia* about eminent members of the Class: Lebaron C. Colt, long lost in our records, has finally been reported at 10 Woodrow Avenue, Montgomery, Ala. — George Fogg has enrolled at the University of Chicago for a

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year's work in the School of Social Service Administration. — Rufus Briggs has contributed Chapter 10, entitled "Fundamentals of Resistance Welding," to the American Welding Society's "Welding Handbook" for 1938. — On July 11, Arthur Baker called. His work with explosives is in New Jersey near our new Chemical Engineering Practice School. — On July 13, Eugene Chase called, and we spent a pleasant hour with him, hearing of his new work in the export field supplemented by a law course. — Francis J. Grueter is now with the Electrolux Corporation, 500 Fifth Avenue, New York City. This is the corporation that Ben Richardson has made famous. — On April 25 it was announced by Walter and Samuels, Inc., that William Kalker had been elected vice-president. For many years he has been manager of the firm's mortgage loan department and is widely known in the mortgage field.

The Secretary hopes from time to time to present in some detail the experiences of various members of our Class who have had interesting and notable careers to date. After long waiting and a certain amount of cajolery, he has obtained from Bill Latham some details on his work with Robert Moses in the Department of Parks of New York City. Bill has done a remarkable job, and his rapid rise in a group of workers where the results have been brilliant attests Bill's outstanding competence. Perhaps he would object, but I prefer to supplement his letter with these essential facts.

Here's what Bill writes: "After batting around on a couple of small construction jobs and spending six months surveying in the semiwilds of Venezuela, I finally happened on a party-chief job with the Long Island State Park Commission. That was in December, 1927. The survey work kept me in the field for a few months, and then I started a series of evolutionary steps in park engineering, such as inspection, design, drafting, and finally land acquisition. The last was the most interesting and consisted of begging, borrowing, and occasionally, when there was money, buying land for parks and parkways all over the island.

"In March, 1934, after the boss had taken the city job, I happened to be underfoot when a new head was needed to handle the planning division. From that time until last December, I supervised the preparations of plans and all the engineering field work on the big work-relief program, with a force of architects, landscape architects, and engineers varying from 300 to 1,800. It was a rather hectic setup all the way through, and we had our full share of the New Deal alphabet to contend with. Approximately chronologically it went something like this: C.W.A., T.E.R.A., E.R.B., and W.P.A. There may have been others, but they didn't last long enough to be worth remembering. All told, we turned out plans for over two hundred million dollars' (work-relief dollars) worth of park improvements. The major items of interest were three zoos, ten 18-hole golf courses (play so far this year 350,000 rounds), 11 swimming pools (attendance to date this year over a million and a half), two beach developments with bathhouses, parking fields, and so on, one stadium seating 21,000 people, about 250 playgrounds, several athletic fields, and sundry other items that go to make up the recreation plant for a city of seven million.

"Last December 1, I was most unceremoniously 'dropped over the fence' to the job of director of maintenance and operation, still retaining my engineering title (Civil Service). This means basically that I am recreational host to the millions (both washed and unwashed). I cover the whole city, including substantial portions of the water front. The maintenance force right now numbers about 45,000, and it's not enough to do a proper job on over 600 park areas totaling an area of over 20,000 acres. To make things interesting, there are still a few of the old political job holders scattered around, but I've been smoking them out one by one, and they work, or else.

"I could write a lot more along this line, but it would only put you to sleep. You asked about other Tech men who had a part in this mad relief scramble. I am glad to say there weren't many. Proportionally speaking Tech was not well represented in our technical force at any time, and the only conclusion I've been able to draw is that Tech men kept their jobs better during the depression (and recession) than did their brothers from other institutions. I never paid much attention to where a man came from so long as he did his job. We did make a brief study, when the force was at its peak, of the educational antecedents of everyone, and as I remember it, there were 10 Tech men out of about 1,800. Al Heyser was in the outfit for a couple of years; then he went back on a Civil Service job for a while, and now his address is Care of Alaska Railroad, Anchorage, Alaska. Dick Li was with us for a while between jobs with Waddell and Hardesty, Robinson and Steinman, and the other contractor on the Triborough Bridge, Harlem River left span. Dick is living out in Bayside with a very charming wife and two boys who will no doubt be engineers in due course. Joe Hautman '25 was our chief architect for about three years, until he took a job in charge of the drafting squad for the World's Fair board of design. John Hatton '09 designed the most outstanding of our new buildings and is now back in private practice, still designing for us when we can get money for contract work. Offhand I don't know of any Tech men still in the outfit, although we still have a W.P.A. technical force of 400 or 500." — J. RHYNE KILLIAN, JR., *General Secretary*, Room 3-219, M.I.T., Cambridge, Mass.

1928

Since we last delineated some facts about the Class and its members in this column, our big 10th reunion was held on June 3, 4, and 5 at Ye Castle Inn, Saybrook, Conn. A rousing good turnout of 81 men attended during the week-end, and the general consensus of opinion was that this was a surprisingly fine gathering of the clan with economic conditions as they were and are.

Who were these loyal lads at Castle Inn? Well, sirs, the list is a long one, but here it is: Bob Proctor, Ed Walton, Lou Miller, John Connelly, Don Kennedy, John Chamberlain, Bill Birch, Gerry MacGillivray, Norm Fournier, Bob Carder, Bill Carlisle, George Chatfield, Tom Larson (our golf champ), Joe Guertin, Rudy Slayter, Al Puschin, Al Dempewolff, Frank McGuane, George Hubbard, Mieth Maeser, Jim Donovan, Walt Smith, Ralph Jope, Bill Kirk, Bob Harris, René Simard, Dick Davidson, Bill Bendz, John Carvalho, Rol Earle, Fred Riley, Gerry Patrick, Benny Hough, Dud Collier, John Russell, Arthur Keith, Hal Porter, Terry Hurlbut, Sid Brown, Maurice Beren, Frank McDermott, Harlan Paige, Rube Schuler, Doug Tooley, Ames Hettrick, Chuck Cristofalo, George Mangurian, Jim Tully, Joe Riley, Jim Rae, Cole Armstrong, Chet Day, Grant Flynn, John Melcher, Art Robinson, Al Knight, Dick Hoak, Hy Weinberg, George Bernat, Dave Olken, Ed Stevens, Carl Bernhardt, Fred Wolf, Des Shipley, Joe Mulvey, Harold Harrington, Cris Case, John Robinson, Charles Berry, Ernie Knight, Ev Lester, Jim Ure, Henry Buntschuh, Bill Grunwell, Chuck Lyons, Bob Peatfield, Joe Parks, Ken Clark, Dave Donovan, Joe Gaffney, and finally, Bud Wilbur, our adopted son of the Class of 1926.

Well, gang, it was a bang-up time; everyone did as he pleased and had a good time doing it. The bull sessions waxed long and loud, and much good, congenial poker filled the rooms at Saybrook while various and sundry would-be cardsmen tried to bluff through a pair of deuces. A little good golf was played by such sharks as Tom Larson, Gerry MacGillivray, and Bob Harris, while the rest of us batted the ball all over the park and had a grand time ribbing about it. The class banquet revealed some interesting results to anonymous questionnaires, which we will herewith repeat for the benefit of those not there. These results are for the most part averages from 45 questionnaires.

The average '28 man carried $16,800 worth of life insurance; 23 per cent of the Class own their own homes, with an average valuation per home of just under $8,000. In answer to the question, "How much are you worth?" 31 reported an average of $14,000 or a median figure of $5,000. The group was split exactly in half on the field of employment question. Half are following the line of their Technology training; half are not. Thirty-two said they would send their sons to M.I.T.; seven said they would not. On the political question 23 per cent said they voted for Roosevelt in 1932, and 30 per cent said they voted for F.D.R. in 1936. Only 14 per cent said they would vote for our Fireside Friend should he run in 1940, while even less (11 per cent) said "yes" for another New Deal candidate. Now to the kernel of the nut —

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the salary question. The average earnings of '28 men was $3,800, with the majority designating figures between three and five thousand dollars.

It is interesting to compare these results with those from two other ten-year surveys. The first is the average of 32 questionnaires filled out at the 10th reunion of Brown '28. Their average yearly income was given as $3,300. The second survey is the Harvard College Class of 1928 Decennial Report. This is published in book form (293 pages) and represents a very complete tabulation of questionnaires returned by mail from 659 members of that class. According to the Harvard report, the average Harvard graduate of the class of 1928 has an income of about $3,500, an automobile, possibly one servant, and a rather strong dislike for the New Deal. This survey also revealed that most of the members of the class drink on occasion and live in a rented apartment or house in a large city or its suburbs.

Now with reunion news and survey reports under our belts, we proceed with news of the Class from here, there, and everywhere. Before us we have the digest of a paper on "Sarasota Municipal Seawater Regenerated Zeolite Water Softening Plant," which was designed and built under the supervision of Charles Richheimer, Vice-President of G. A. Youngberg and Associates, Inc., of Jacksonville, Fla. This installation is entirely automatic, and the use of sea water furnishes Sarasota with softened water at the amazingly low cost of ten dollars per million gallons as compared to a chemical cost alone of $193 per million gallons for standard plants.

Dennis Ver Planck is now an assistant professor of electrical engineering at Yale. — Charles Ricker and Miss Emily Ann Elliott were married on September 17 in Cleveland. — Tom Larson has moved to Charlotte, N. C., to be with the southern office of his company, the Carbic Color and Chemical Company, as technical representative and salesman to call on southern mills using dyestuffs. Tom's territory includes Virginia, North Carolina, South Carolina, Georgia, and Tennessee.

The Hal Porters have a new arrival, John Hardy Porter. That's swell, Hal! — Gordon Collins and Miss Barbara Jane Harris were married at Raleigh, N.C., on July 16 and are now at home in New Haven, Conn. — F. C. Sweeney is with the Graybar Electric Company. — Joseph K. Roberts, assistant to Bruce K. Brown, general manager of research and development of Standard Oil Company of Indiana, has been promoted to director of research, President Edward G. Seubert announced recently. Under Mr. Brown's direction, Roberts will supervise research activities at refineries at Whiting, Ind., Wood River, Ill., Sugar Creek, Mo., Casper, Wyo., and Neodesha, Kansas. Roberts joined Standard Oil in 1928 as a chemical engineer at Whiting, after receiving his master's degree from the M.I.T. and bachelor's degree from the University of Kentucky. He was promoted to assistant director of research at Whiting in 1934 and assistant to the general manager of research and development at Chicago in 1938.

John Melcher and Miss Beatrice Hildegarde Evers were married on June 11 in Cambridge and are now living in Boston. — We have the engagement announcement of Ed Woodbury to Miss Mary Barbara Beal of Evanston, Ill. — The Walter Ridleys have a new son named Harvey Allen and our sincere congratulations. Walt is with Riggs and Lombard, manufacturers of textile machinery, in charge of their textile dryer division. — We regret to announce the death of classmate Ashod H. Partamian on September 17 following a nervous breakdown. — The July 21 issue of San Francisco's *Wall Street Journal* carried a long and interesting article headed "British Order May Mark Turning Point for Lockheed Aircraft." The order was for 200 reconnaissance bombers at a cost of $18,000,000. This article mentioned that Hall Hibbard was vice-president and chief engineer of Lockheed, fully responsible for development of new designs. Congratulations, Hall!

The following paragraphs about Marshall McCarroll were written by Warren McGrath and appeared in the *International Photographer* for June: "To M. G. McCarroll, soundman for Paramount News, goes the lion's share of credit for working out the extremely flexible system now in use by the newsreel producing companies operating in Southern California. McCarroll, a member of Local 695, IATSE, is a graduate of Massachusetts Institute of Technology. In the methodical manner characteristic of good design engineers, McCarroll laid down a list of minimum requirements to which he determined to hold. Among these were: fidelity over a range covered by all possible newsreel recordings; ability to deliver to each recording amplifier a signal at workable level correctly matched for impedance; and the necessity of absolute freedom from intercoupling effect resulting from the varied input circuits into which it had to work. Added to these main requirements was a list of secondary importance imposing enough to cause crack engineers to reach for a slide rule and a ream of paper.

"The first microphone distribution system was in itself a highly satisfactory device. It was greeted with enthusiasm by the men in the field and promptly christened 'The Mike Spider Box.' Subsequent improvements resulted in the present ten pound affair, entirely self-contained and capable of working one dynamic microphone or a maximum of two crystal microphones into as many as five recording amplifiers. Today the Mike Spider Box is deemed as important on jobs where all newsreels are working as the microphone itself.

"Of course, there still was the problem of that one microphone. A problem which was mostly solved by the sound development laboratories. Soon the small, rugged, dynamic type microphones replaced the cumbersome boxes housing condenser units and associated amplifiers. Neat black lacquered pedestal stands replaced the all too noticeable wooden tripods, but the problem of placing the microphone close enough to overcome background noise seemed still to be with us.

"McCarroll and this writer coöperated in developing the next improvement — a portable microphone boom. With this boom microphones can be placed within eighteen inches of the speaker's mouth on head closeups and still be outside of the frame line. It can be assembled in about one minute and collapses to a compact bundle about four feet long and ten inches in diameter. Its weight is a mere seven pounds and when opened to its full size, reaches seven feet in the air with a 52-inch arm. It is designed to safely handle the conventional 618 type dynamic or an eight ball mike unattended." — GEORGE I. CHATFIELD, *General Secretary*, 6 Alben Street, Winchester, Mass.

1929

With the opening of this volume of The Review, we should bear in mind that when it is about finished, next summer, we should be in the midst of the celebration of our 10th anniversary as alumni. What the program will be it is too early to announce, but it is not too early to begin planning for this occasion which marks an important milestone in our careers. Let us start gathering the shekels from this day until next June to insure the wherewithal to finance our individual expenses connected with the trek back East.

That this is a milestone in our lives seems to be well settled, for we have received press clippings covering more departures from single blessedness than at almost any one time in the past. In June the marriage of Miss Lena Drisko of Boston and John North, II, at Portland, Maine, was reported. They will reside in Palmer, Mass., where John is plant engineer for the Wickwire Spencer Steel Company. — On July 16 the marriage of Miss Elizabeth Burrows of Brookline, Mass., and Robert Hunter, II, took place in Brookline. Though not announced, it is presumed that the couple will live in the vicinity of Boston where the bridegroom is a surveyor for the Massachusetts Department of Public Works. — In August, Virgil McDaniel, XV, returned to the vicinity of Boston from his present residence in the Detroit area to be married on the evening of August 13 to Miss Elizabeth Bell of Wellesley Hills, Mass. The ceremony was performed in Wellesley, and after their wedding trip, the couple will live in Detroit, Mich., where Mac has been doing big things during the last few years.

In addition to the foregoing marriages we now have from the pen of B. Gratz Brown, II, himself, word that he is to be married after all these years. His personal writing covering the subject would hardly be enough to make a good sentence, but the clippings he forwarded told volumes. Late in August, New York newspapers carried the announcement of

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his engagement to Miss Willette Ockendon. Now that Brig Allen is married and Gratz has indicated his willingness to join our ranks by espousing a wife, we can expect any of the so-called confirmed bachelors to break down one of these days. — New York and Boston newspapers early in June carried the announcement of the engagement of Miss Winifred Conway of Allston, Mass., to Francis J. Donnelly, II. Francis is located in New York, where he is a technical engineer with Babcock and Wilcox. — The Class joins in wishing the foregoing newlyweds great happiness, health, and prosperity through their coming years of life together and congratulates Gratz and Francis on their engagements.

Boston newspapers during the early part of July stated that George Badger, VII, had received the degree of doctor of medicine from the University of Michigan this summer. In the past George has been located in Detroit but will live in Baltimore where he will serve on the staff of Johns Hopkins School of Hygiene and Public Health. To George, the Class extends congratulations.

There is not much new to quote about us around Akron. We are happy to report that the baby girl who came into our family last February 28 is doing very well and weighed 21¼ pounds at six and a half months. We are all keeping our noses to the grindstone these days. Hank Gibbons, II, is back with the Zeppelin Corporation again. Gene Gilman, X, is in chemical engineering at Goodyear, while Johnny Hartz, X, is now tire compounding at Goodyear. Hal Dick, II, is still with the German Zeppelin Corporation as observer for Goodyear Zeppelin and about now (September) is probably wishing he were back. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1930

Hats off to Reg Bisson, XVII, Lou Verveer, XV, and Herm Scott, VI-A. William Joseph is the pride of the Bisson household and tipped the scales at 3,110 grams (according to his proud father) when he was born on the first day of September. If my conversion factors serve me correctly, he must have weighed just under seven pounds. — Lou Verveer took as his bride Miss Janet Zerfass at Algona, Iowa, on July 16, and the newlyweds have the latchstring out for all classmates at 647 49th Street, Des Moines. — Scotty was married on August 27 to Miss Eleanor Mary Bates of Somerville, Mass., where the Scotts will make their home. — We of 1930 extend our sincere and heartiest congratulations.

Word comes from Kearny, N.J., that Ed Prendergast, VI-A, is working there with Western Electric after completion of a year of special graduate study in business management at the Institute. Several of our classmates have taken a similar course of study at the Institute since graduation, and Prendy is the latest. Bill Howard, I, Jack Latham, II, and Ed Hawkins, I, are all back in industry after receiving a bit more "schooling."

Professor Locke '96, our genial Alumni Secretary, furnishes the following information concerning Bob Henderson, III: "Bob is now in Climax, Colo., and through his uncle (George Henderson '06) I have just learned that Bob suffered an accident in the mine during the past winter. He slipped and fell back about 75 feet in a raise, which resulted in broken bones and lacerations, involving a sojourn in the hospital. However, it is now understood that Bob has fully recovered and is back on the job again." We are all glad to know that no permanent injuries were sustained and that Bob is back in the saddle.

All of which brings us to the point where we express the hope that Bob and a good many of you other men will jot down in your date books the first three days of June, 1940, as the time of our long-awaited tenth reunion! Yes, we've been out of the Institute all of eight years now and the next two will roll around before we realize it. So start to make your plans to attend the reunion and Alumni Day in 1940. This may be a little early to start the publicity rolling, but we want everyone to have plenty of warning. Meanwhile take pen in hand and write a few lines to your weary Class Secretary, telling of your recent activities, additions to your families, new jobs, new houses, and fellow classmates you've run across. All such news will make interesting reading for the rest of the Class. — PARKER H. STARRATT, *General Secretary*, 75 Fenno Street, Wollaston, Mass.

1933

This is our first issue since that swell week-end we had last June. Too bad that five-year intervals are so far apart. Of course, it is possible to have a reunion every year, but I wonder whether we would get the kick out of it every year that we do when we have it less frequently. Also, could we get people to come from places like Denver and Alabama, as we did? Even the weather couldn't dampen the spirits of the crowd that week-end, for in spite of the heavy rain we had on Saturday afternoon, everyone had a grand time. Those of you who didn't come, please take note to come in June, 1943.

We have obtained a tremendous quantity of information about the fellows through the questionnaires we sent out, and rather than fill this column with all this information we intend to prepare a quinquennial bulletin, which will include some of the photographs taken on the week-end and also the information on the boys, and send it to everyone. The week-end worked so successfully that we shall probably be able to publish this bulletin and still break even, which is a pretty good record. By the time this reaches you, we hope that the bulletin will be out.

Some of the high lights of the week-end were a golf tournament and soft-ball game on Saturday afternoon with the rain coming down in buckets. Everyone got thoroughly wet, but none of us was the worst for wear. Saturday evening the "best story of the evening" contest produced evidence of some rare talent among the crowd which we are afraid to print in this magazine. There was a certain fellow from out West, who surely indicated that people don't spend all their time in church out there either. To Otto Putman goes the distinction of being the most persistent man of the evening. He tried and finally got a crap game started in the ladies' powder room, only to have the game broken up by the night watchman. Sunday turned out to be a fine day, with more golf and tennis, and a big-league soft-ball game between the Class of '33 and the Norwich Inn caddies. They tossed a tight pitchers' battle and ended with a score of about 28 to 29, and nobody knows who won.

After dinner on Sunday the crowd broke up. Some of us stayed over till Monday morning, and many left for home. Those of us who went to Boston on Monday for the all-Technology reunion had another fine day and evening, and I am sure we all want to commend the committee who planned that day and particularly that evening, for they did fine work. Yours Truly doesn't know when he had more fun in one three-day week-end than that week-end in June. Also, as to numbers, we had about 50 people for our class banquet on Saturday evening at Norwich, and we had 25 to 30 at the all-Technology reunion on Monday night. These figures compare very favorably with what other Classes were able to do. We hope that when we get along to our 25th and 50th reunions, we may do as well as the Classes of 1888 and 1913, who had about 40 and 120, respectively, at the Alumni Day banquet. Think of it — after 25 and 50 years — that surely is a fine showing.

I have a letter from Theron C. Johnson who is at General Electric who informs me that he "had a vacation of about two weeks the last of July and seized an opportunity to travel to Los Angeles with a fellow going out for a job with Douglas Aircraft. We saw five national parks, lost our way in a cloudburst, slept in a C.C.C. camp, and spent three days in Los Angeles. Then I flew back as I had to get to work. Not recommended for real sight-seeing, but you gain a fine idea of distance and heat. Driving in an open car is the only way, but it's tough on the skin. It was too hot in the plane to sleep much before we reached Dallas, where we swapped planes because of engine trouble."

We have bulletins informing us that Wallace de Laguna has been appointed to teach in the department of sciences and mathematics of Queens College, Long Island, and that Edward R. Atkinson has been appointed assistant professor of organic chemistry at the University of New Hampshire. We also have some sad information about Henry Webb Salisbury, who, together with his entire family, was killed in an airplane crash in California on May 16. He taught in the aeronautical department of the University of Minnesota and then entered the

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employ of Northwestern Airlines. He married Miss Betty Eugenie Carle on January 21, 1933. They had a son and daughter who were killed in the accident with them. We are sorry to receive this type of news.

The society columns give the following engagements: Donald Winkler to Miss Barbara Hutchison (Winkler is in business with his father in Wakefield); Edward L. Dame to Miss Arla Burnley Welsh, who planned to be married in the fall (Dame is with the Philadelphia Electric Company); Lawrence Kingsland, Jr., to Miss Margaret Fitz (Kingsland is now a member of the Class of 1940 at the Harvard Medical School); Louis D. Alpert to Miss Dorothy Miller; Frederick A. Ladd, Jr., to Miss Margery B. Kilbourn.

We have the following marriages to announce: Richard Gorman, Jr., to Miss Kathleen Barthen on September 17 at South Orange, N.J.; Alanson G. Bowen to Miss Agnes Parsons early in July (they are living in Southbridge, Mass.); Dayton H. Clewell to Miss Vesta Jean Rapp on June 25 at Roslindale, Mass. (they are living in Texas); J. P. Warbasse to Miss Gertrude Benjamin on May 28 (they are living at Abbington, Pa., where Dr. Warbasse is resident physician in the Abbington Memorial Hospital; Roger L. Putney to Miss Marjorie Blanchard on June 29 at Weymouth, Mass. (they are making their home in South Weymouth and Putney is continuing as an instructor in mechanical engineering at the Institute); Waldron S. Macdonald to Miss Dorothy Best on July 29 at West Newton, Mass.; John D. Williams to Miss Beatrice E. Beckwith on May 14 at South Sudbury, Mass.; Robert F. Way to Miss Margaret R. Shepard on May 15 at Short Hills, N.J., where the couple plan to make their home; Willard F. Wadt to Miss Rena Mettam on June 11 at Bayonne, N.J. — We also have an announcement of the arrival of Allan Heywood Vaughan at the home of Matilda and Allan Vaughan on July 17.

I am sure that you extend to all these folks your best wishes. This ends our story for this month. Please note that this column exists only by virtue of the news we are given by you. So please send letters now and then. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-102, M.I.T., Cambridge, Mass.

1934

Early in the summer I had a very nice letter from Freeman Hudson. Perhaps some of his news has been superseded by this time, but here it is for what it is worth. As most of you know, Freeman did not complete his work at Tech in 1934 and returned the next year to receive his degree. The following summer he continued study at the Institute in connection with the work he had done for a thesis. Thereafter he went to work for Colgate-Palmolive-Peet Company in Jersey City in the standardization department. Since then he has been transferred to the home office standardization department which is still in Jersey City. He was married last January 29 to Miss Ethel McKenna of Roselle, N.J., and they are living in Jersey City. Congratulations, Free, and best of luck with Dictator Hague.

Freeman says that Bob Moody surprised him sometime in April by calling at his office, at which time Bob announced that he was sailing for Germany. Bob got a job with General Motors Export Company when he finished school and was working in New York until a year ago September. Then he was transferred to Detroit to acquire more experience. He has now been sent to one of the plants in Germany for a year. Freeman knows that Bob got across because he received a post card marked Copenhagen.

Gordon Day, who had a job as junior engineer on the Flood Control Project in Vicksburg, Miss., is back North now. The climate in the South did not agree with his family, and he did not like the job anyway. He is now working for some contractor doing repair work on buildings. For those of you who do not already know, Gordon is the proud papa of a son, James Caret Day, who was born in Vicksburg a year ago last January. Gordon and his wife gave a little get-together which included a few members of our Class. Among them were Freeman Hudson and his wife, John Moomaw and his wife, and Harold Thayer and his then fiancée, Miss Eleanor Constantinides. As was announced in a previous issue of The Review, Harold and Eleanor had set the wedding date for May 14. So by this time they should be an old married couple. Harold is still working as a salesman for the Calco Chemical Company.

Johnny Moomaw is working in the production department of Krebs Pigment and Color in Newark, N.J., and is living in East Orange. — Ash Woodhall, who was with our Class the first two years and then completed his education at New York University, is working for Colgate-Palmolive-Peet Company in Jersey City. Last October he married Miss Janet Brown of Jersey City. — Gordon Way is out in California writing movie scenarios, or, as has been suggested, perhaps he is trying to beat Robert Taylor's time. — Al Rogowski has been working in the research department of Worthington Pump and, incidentally, is living with Tuffy Emery in Jersey City.

During the first part of the summer I was doing some work at the Eastman Kodak paper mill in Rochester. Remembering that Phil Kron was holding down a position in some part of the plant, I looked up his name in the directory and gave him a ring. A sweet feminine voice answered: "Mr. Kron's office." Pretty nice, Phil old boy, having a private secretary to answer your phone calls, but, then, Phil is holding down a responsible job as industrial engineer and needs a good secretary to keep his work in order. I had dinner with Phil and his wife that night and thoroughly enjoyed talking over old times.

Later in the summer I ran into Bill Beckett at the annual convention of the American pulp and paper superintendents, which was being held at Toronto. Bill was representing the Beckett Paper Company of Hamilton, Ohio, and unlike most of the representatives who attended, he displayed unusually good common sense and got to bed by two o'clock every morning of the convention. Bill is now the father of two little girls, for which he deserves congratulations.

Roger Coffey is back in Boston, working for the Engineering Corporation. The last time I saw him he was doing test work on an airplane engine of the type which was said to have been responsible for one of the crashes in which a number of people were killed during the summer. The test was being sponsored by the insurance company which was being sued for heavy damages. Roger says that Leo Carten is also back in Boston after being transferred from the Army Proving Grounds at Aberdeen, Md.

The last time I was in Southbridge, Mass., I stopped in to see Frank Baxter and Carl Wilson at the American Optical Company. Frank is now assistant superintendent of the machine shop and had definite plans for taking the final step in holy matrimony. More details about that later. Carl is head of the time-study department with a fair-sized staff of men under him. He has not any plans concerning wedlock and has just bought a sailboat, which holds the warmest spot in his heart at present. — Herb McKeague, who was working for American Optical, now holds a position as industrial engineer at the Tobe Deutschmann Company in Canton, Mass. — The last time I was in Nashua, N.H., I stopped in to see Neil Putnam at the Improved Paper Machinery Corporation. He is doing engineering work on high-density wet machines, pulp washers, and other modern paper mill equipment. He reported that Brad Hooper and the latter's wife had paid a call on Mr. and Mrs. Putnam and daughter not long ago. Brad is working for the Babcock and Wilcox Company in their ceramic division in Georgia.

At two different times this summer two of our classmates made visits to Foxboro to acquire some knowledge about control equipment. John Newbegin came from the Oxford Paper Company in Rumford, Maine, and took a two weeks' course in instrumentation and control pertaining to instruments which are used in paper mills. Later on, Paul Wing came on from Chicago, where he is employed by the Universal Oil Products Company, and spent a shorter period of time brushing up on instruments.

Incidentally, since some of you may be wondering how I happen to run into so many of our classmates at various places east of the Mississippi, I might state that I am still working for The Foxboro Company at Foxboro, Mass., in the pulp and paper division. I am in charge of paper mill instrumentation in the northeastern division, which covers New England and Upper New York State out to Niagara Falls. In the course of my work,

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I have to visit a large number of paper mills and therefore cover quite a bit of territory.

In the society columns have appeared a few announcements of interest to the Class. On April 21, Kevin Malone took the vows with Grace Adelia Strauch, daughter of Mr. and Mrs. Charles C. Strauch of Sacramento, Calif. They will live at Surcease Mine, Oroville, Calif. — On July 2, Charley Glueck took the final step with Miss Betty Stone Weidman, niece of Miss Bertha L. Stone of Dunkirk, N.Y. They will make their home in Roslyn, Long Island.

And so, "so long" until next month, and remember, with all the letters you men are going to send in, this column is going to be bigger and better and busier each succeeding month. — JOHN G. CALLAN, JR., *General Secretary*, 24 Quincy Street, Cambridge, Mass. ROBERT C. BECKER, *Assistant Secretary*, South American Development Company, Apartado 655, Guayaquil, Ecuador, S.A.

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Primary item of interest this time is Alumni Day of last June 6. During the morning I ran into Charlie Hanley, who continues to design ships for Gibbs and Cox. He has been there two and a half years now, having been at the Federal shipyards for a short time after graduation. He was wandering about the old place and, I guess, reminiscing. Next fellow to put in his appearance was Jack Hossfeld, who is still with United Shoe. Jack reported: "No news — no marriages or prospects." During the morning I also ran across Dexter Clough, who is studying medicine at the University of Pennsylvania. He likes it very much and expects to specialize in eye work. Dex will finish at University of Pennsylvania next June and will then have several years of internship to look forward to. Henry Kimball popped up about that time to say that he is getting along well in the experimental department of United Shoe. He mentioned that Guy Talbourdet is also working there and doing well. For amusement Henry has been golfing, mountain climbing, and skiing.

During the morning I also picked up the news that Jim Parker will probably be married by the time this is published. Also, Gerry Rich should be a father by the time this goes to press. Jim Libby has gone to the Jackson Laboratory of Du Pont, having received his D.Sc. at Tech last June. At the Alumni Day luncheon in the Court I found Chet Bond, Dudley Williams, and Dave Greenlie. Dave, as has been mentioned before in this column, is working in the Department of Biology. He has been doing quite a few research jobs for outside firms. Dudley Williams expects to return to Tech to study for his D.Sc. in chemistry. Chet Bond is selling refrigerators, stoves, and so on, for the Boston Consolidated Gas Company and has been doing so for the last year and a half.

Art Linn has left Federal Products in Providence to go with an electroplating company in Waterbury, Conn. The electroplating is more down his alley. — Art Croxson has joined the Kimberly-Clark Corporation in Neenah, Wis. Phil Johnston is reported to have been married in July. — Jud Briefer has left Buffalo to work in New York City. — Paul Daley is back in Aurora, Ill. (about 30 miles west of Chicago). He has been working for the Anderson Prichard Oil Corporation. — Pete Grant is reported to have invented a Rube Goldberg gadget for automatically taking, developing, and printing pictures while you wait. You just drop a coin in a slot and presently your picture appears all printed. Pete is vice-president of Grant Photo Corporation. The gadget is used in Five and Ten Cent stores. — Fiske King is reported to be driving a display truck all over the country for Graton and Knight Company. — Bill Yepsen is now a teller at the uptown branch of the Manufacturers Trust Company in New York City. Bill Cross, Bill Yepsen, and Pete Grant had quite a time at the German-American Club in New York a while ago.

Jack Du Ross, who was married early in the year, is reported to have been in and out of two jobs and now has a third. He has been investing in railroad bonds; one wonders what he sees in the poor bankrupt railroads that is worth while. I have been informed that Ben Blocker has finally been married. If I remember correctly, I got a bit mixed up on reporting Ben's affairs some months ago. This time I think the news is correct. — Bud Taft is said to be working in one of the Du Pont dynamite plants and to be flying an airplane for relaxation — what a man! Rumor has it that if he lands the plane again in his girl's back yard, the old man will get after him with a shotgun for tearing up the lawn. — Al Greenlaw is reported to have been in Boston for a week-end during the spring — no one seems to know why or for how long. — Dick Cook has been working for the Merrimack Woolen Mills in Lowell, Mass., for the last two and a half years.

Other items I picked up during Alumni Day include the news that Purcell has gone to England. He was in Jamaica, British West Indies. The reason for the change is beclouded by doubt, so I'll wait and hope Dick will send in the low-down himself. — Phil McGoohan finished up last June at the Chrysler Graduate School, a two-year course, and expects now to start working for Chrysler. We missed Stocky on Alumni Day, as he had gone home to rest for a while. The grind of teaching classes, taking courses, working on a thesis, and working in Walker had worn him down.

Having disposed of the miscellaneous news picked up during the day, we'll get back to the events. At 5:30 P.M. 18 of the fellows met in the University Club for a bull session. In fact that is where a good many of these news items were picked up. Those present were Larry Stone, Dave Dale, Charlie Partridge, Albion Fletcher, Jack Burton, Dexter Clough, Dave Greenlie, Dick Lawrence, Bill Cross, Ham Dow, Izzy Woll, Pro Prohaska, George Forsburg, Chet Bond, Dick Cook, George Glaskaws, Charlie Smith, and myself. I think the activities of most of these fellows have been reported fairly recently in this column, so I'll not repeat. After the get-together at the club several of us went to the Alumni Dinner at the hotel Statler. Chet Bond, Jack Burton, Dave Greenlie, Dudley Williams, Lee Tolman, and I made up the group there. We shared a table with the Class of '36 — such an ignoble disgrace for our Class. Next time we'll hope enough fellows show up to justify a table to ourselves.

So ended another Alumni Day. Two more years and we'll have our first five-year reunion. I'd sure appreciate any suggestions you can make for a program for our reunion. Drop me a line and mention what you would like to do at a reunion, and don't forget to include some news about yourself for this column.

A couple of items which I missed before are that John Kohr was married last Christmas. Let us know the details, John. He is working for the Gorton Pew Fisheries in Gloucester, Mass. Howard Bernhardt is now working for the Campbell Soup Company in Camden, N.J.

Up to this point the column was written last June while the events of Alumni Day were fresh in my memory. From here on the news is as of September 18. All of you received a post card requesting certain information. As a result of this survey, I plan to publish, in the near future, a mimeographed report on the state of the Class. This report will give the present address, work, marital status, and employer of those fellows for whom I have such information. This will be mailed *only* to those who replied to my questionnaire. In case any of you who read this news column have not answered my questionnaire and wish to receive the published survey, write to me immediately giving full details of your present status as requested on the post cards. I will not publish the survey until two weeks after this issue of The Review is delivered, thus giving you time to make amends and receive your copy of the survey.

In view of the fact that information concerning the status of about 400 of the Class (out of 1,000) will be published shortly, I will not repeat by giving the news here. Please note that my address is now Rochester. — ROBERT J. GRANBERG, *General Secretary*, Central Y.M.C.A., 100 Gibbs Street, Rochester, N.Y. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

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Alumni Day at M.I.T. last June proved to be the best that was ever held. Those of you who were not there certainly missed a good time; I was sorry more of you were unable to attend. The following members of our Class found themselves seated together in the main hall of the Hotel Statler, which had been transformed for the occasion to represent Dinty Moore's: Al Horton, who is utilizing his abilities as assistant to President Compton and assistant to the Class Secre-

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tary (Al would be glad to hear from any of the Class who would write to him or visit him at his office); Phil Norton, who had recently terminated his employment with the General Electric Company in Bridgeport, Conn., as a radio tester; John P. Hamilton, engaged in research for the Union Carbide and Carbon Corporation at the Niagara Falls laboratory and Secretary for Course XIV; Elliott Robinson, assistant in the testing materials laboratory of Harvard; and your Class Secretary, Tony Hittl, employed by the laboratory of the Linde Air Products Company in Buffalo. Seated near by was Phyllis Needham, who had spent a busy day working on the Alumni Day staff. Phyl is employed by the Institute in the Admissions Office, where she has charge of admissions for graduate students, but in her spare time she is still doing research in reinforced concrete. Several other members of the Class were at the Institute on Alumni Day, although I did not see them at the banquet. Dick Bryant and Ken Swain are assistants in air conditioning and refrigeration at the Institute. Brockway McMillan is beginning his last year of work in the mathematics department for the Ph.D. degree. Al Musschoot is working for the Jeffry Manufacturing Company of Columbus, Ohio, manufacturers of conveyors and mining equipment. Henry Herpers is a graduate student in the Geology Department, specializing in minerals. Bob Sherman, Secretary for Course V, was completing his second year as assistant in analytical chemistry. This year he will be an instructor in chemistry at Phillips Exeter Academy. Jack Cook, Course Secretary for VI-C, was assisting Dr. Barrow '29 in his experiments on ultrahigh-frequency radio waves. Jack has an apartment at 98 Hemenway Street in Boston.

Course I. From Stan Levitt has come the disappointing news that his scheduled marriage to Miss Hilda Simmons of Greenville, Miss., had to be postponed. But Stan couldn't stand to be in New York a long way from Mississippi, so he gave up his job with Ash, Howard, Needles, and Tammen to become a designer-draftsman for the Louisiana State Highway Department in Baton Rouge, where his girl goes to school. — Seth Nickerson has left the seclusion of his Cape Cod home town to work for Graves and Sons of Ridgefield, N.J. It sounds like an undertaking firm, but I imagine it's a contracting outfit. — Joe Fratus is with the Duplex Construction Company of Richfield Springs, N.Y.

Course II. Secretary for this group is Jim Fergie Patterson of the laboratory of the Linde Air Products Company, Buffalo. Jim has recently moved to 136 McKinley Avenue, Kenmore, N.Y., where he shares an apartment with four of his fellow lab workers. — Scott Redfield is now located at the Syracuse Airport where he is employed by the American Airlines. — Roger LeBlanc is a draftsman for the Bullard Company in Bridgeport, Conn. — Leo Kramer is now instructor of experimental engineering at Tulane University in New Orleans, La. For the past two years he has been working at M.I.T. for his S.M. degree and acting as an instructor in steam lab.

Course III. "By a stroke of good luck, I have a lot of material from none other than John Petroskas, the chap who went to M.I.T. intermittently," writes Stan Johnson, loyal Course Secretary living in Pittsburgh at 4041 Bigelow Boulevard. Stan continues: "Early this fall, John decided to see what the steel world had to offer. Taking his 1929 bag of bolts which he affectionately calls Aunt Jermima, he limped into Pittsburgh one fine August day. He had been job hunting in Boston, Baltimore, and on his way to Pittsburgh had stopped at many metallurgical plants, getting valuable information and quite a few definite leads. In fact, John showed me a letter offering him a job at $5,000 a year plus expenses as a roller in a semicontinuous mill in Holland. He was tempted to take a shot at it, but not having had any actual rolling experience, he felt it best for all concerned to pass up this golden opportunity. John shopped around the Pittsburgh area and finally decided to take a job with Jones and Laughlin in Aliquippa, Pa., in the metallurgical department. I thought he had settled down to work when I got notice that he had taken a hurried last-minute trip to Lake Winnipesaukee. Later developments substantiate the belief that it was a heart interest. He couldn't have stayed there more than an hour or two, as he was back before anyone knew he had gone. Looks as if Cupid is closing in on John.

"Johnny met quite a few Alumni on his 4,000 miles of wandering. Let him tell you about it himself: 'John Pappas was left at Boston doodling in the laboratory with titanium. Steel salesman Gelbert keeps moaning of his razor slipping divorcing his upper lip from some cynical hairs he fondly calls his mustachio. Johnny Kinraide looks as if married life agrees with him. He is on his way to Remington Arms this fall. Roaring on to New York, my faithful Aunt Jermima landed me in Garden City, Long Island, where Mr. and Mrs. Charles Mitchell Parker '34 and son Donnie have just established themselves in a new home in a community that really deserves being called Garden City. The Parker's hospitality ruined my schedule. Crossing the tube, I called on Francis E. Doyle '35 of the Orient Air Conditioning and Refrigeration Company in Jersey City. Doyle is in better shape now than he ever was. He plays and works hard. Handball is his specialty. I was lucky to come out of a game with him with only a big blister on my big toe. Rattling into Kearny, I met Wally Mathesius in the research laboratory of the United States Steel Corporation. Wally seems in better condition than ever. He is being transferred to the Pittsburgh district in the early fall. John Brosnahan '35 is at Bethlehem and is getting along as well as he plays at soft ball.

"'On to Maryland, where handsome J. Mason Culverwell '33 is now a finisher in the "hot strip" and Bob Anderson '35 is doing his stuff in the "cold strip." Mason is heart free, but Bob Anderson is very interested in a young Baltimore charmer for which I don't blame him one bit — I've met her. John W. Miller, Sc.D. '33, Mrs. Miller, Little Jack, and the baby have repelled without loss a series of operations and illnesses. The doctor is working for the Reid Avery Company in Dundalk and is just the same as ever. Gosh! doesn't anybody get old? I presume his boat and his family will keep him young forever. After watering Aunt Jermima all the way to Pittsburgh, I ambushed Stan Johnson, who is just as streamlined now as ever he was. Stan plays and plays, and when he works, he works. Stan could jump 23 feet and play tennis at the same time. Poor Monroe H. Kessler '33 really had a surprise, 'cause when he returned at four in the morning from a business trip, he hit the bed on one bounce and landed on me on the second, and so five years' talking kept us up the rest of the morning. Kes is still the same dashing boy and is in the strip-steel department of Weirton Steel. At Lorain, Ohio, I called on Mr. and Mrs. Luis Sanchez, who have a charming home right on Lake Erie. I succumbed to their hospitality so that I forgot my bathing suit and slippers. This, of course, gives me an excuse to return. Back to Pittsburgh, I drifted over to the Drinnans'. Bob '33, Sc.D., is metallurgist for National Tube and looks even younger than in his M.I.T. days. My tour of the country was brought to an abrupt end in Aliquippa, where I rest my head on Broadhead Road, R.F.D. 2, Box 57 — and I'm not farming. I am with Jones and Laughlin Steel Company in the metallurgical department. Anyone coming through Aliquippa is welcome to stay with me. There is room enough for four in the bed.'

"Wally Mathesius has been vacationing in Canada, following which he plans to continue his fine work for United States Steel Corporation in the Pittsburgh area — more definite news of Wally later. Lea Spring, VIII, has, at least for the present, given up the steel business. During the summer he was fortunate in being elected to go out on the road giving talks and leading discussion groups on his favorite subject, peace. His tour was extremely successful. His plans for the future are as yet not definite, but he has an idea he would like to take graduate work in economics and related subjects at the University of Minnesota, finally going to a school in Washington, D.C., to prepare for work in the diplomatic service. Bob Olsen, Spring's former roommate, is now alone, but on November 5, he will assume the responsibilities of a married man. A very charming lady from Indiana, Pa., has stolen his heart, and may I add, almost stole mine as well. Bob is still working for Harbison-Walker Refractories here in Pittsburgh.

"My work is still with the metallurgical department of Carnegie-Illinois at Homestead, Pa. Production is low, but as long as steel insists on being thermal ruptured, piped, segregated, or off grade, our

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department will have something to do. This summer I joined the local University Club and, as a result, have played quite a bit of tennis with a group of Cornell men who are members also. My new Chevy coupé is treating me as it should. It seldom demands oil and is never hungry for gasoline, for which I am very thankful, as gas prices among the oil fields of Pennsylvania are as high as 22 cents a gallon. So when you visit the Smoky City, be sure to fill up before you get in so you can enjoy a couple of extra beers in town. John Petroskas has given us a line-up on quite a few old-timers, but there are still many to be heard from. All of you loyal Course III men should drop a card to Stan Johnson, Schenley Arms Apartments, Pittsburgh."

More news about Course III comes from Charlie Locke '96: A letter from John P. Hayes states that he had a letter from Charlie Price reporting transfer from Climax, Colo., back to Pennsylvania, where he was going to work with a wire rope company. Hayes, himself, is continuing as a trainee with the Union Oil Company at Bakersfield, Calif. A trainee is a college graduate who is moved throughout the various departments of the company for a period of two years. At the end of that time, if the company approves of him, he is generally given a fairly good position. Just at present, Hayes rates as a roustabout in the construction department. In his domestic affairs, he and Mrs. Hayes have an addition to the family in the form of a great Dane puppy, which is now only seven months old but "eats like a horse." Hayes is strong for married life as being much better than bachelorhood.

Courses IV and IV-A. A new Secretary has been appointed for this Course. He is Frank Parker, 116 West Central Street, Natick, Mass. Frank writes: "I'm still employed by Charles T. Main, Inc., engineers, for whom I went to work after graduation. They do quite a variety of engineering, both designing and consulting, as well as appraisals, but the emphasis for me so far has been on hydroelectric work. I was in Virginia for 15 months during the construction of a plant for the city of Danville. Now we're back in Boston, but I don't suppose it's safe to say we'll stay here." Frank would like to hear from the members of his Course. We have not had much news from this group.

Course VI. Newspapers have carried accounts of the weddings of a couple of members of this group. The first was on June 4, when Betty Reardon, Simmons graduate, became the bride of Dan Finucane. Dan is a popular member of the Yacht Club at Rochester, N.Y. On July 12, occurred the marriage of Miss Edith Smith Noyes and John Muma. Mrs. Muma was graduated in 1936 from Bennington College. She has spent much time studying housing and analyzing housing conditions. She is a member of Mayor LaGuardia's committee for property improvement and formerly was attached to the official staff of the Williamsburg housing unit. John also is interested in housing and civic problems. He and his bride sailed the day after their wedding to study coöperatives for housing, business, and manufacturing in the Scandinavian countries and general housing in France, Germany, and England. On their return they made a joint report to Mayor LaGuardia. We would like to hear more from other Course VI men. They should write to Nick Lefthes, 11 Ward Street, Salem, Mass.

Course VII. Ed Pratt, Secretary for this Course, is still at Harvard Medical School. He can be reached by writing to Vanderbilt Hall, Longwood Avenue, Boston, Mass. — A brief item about Stan Stolz tells that he is now employed by the New York State Department of Health at Middletown, N.Y.

Course IX. Dick Odiorne was recently married (see the last Review) and hasn't been heard from since. However, Dick promised to get some news about his Course, so I know there'll be something soon. Dick has an apartment in Boston at 121 St. Stephens Street. — Word comes from one of our loyal correspondents, W. Boynton Beckwith, that he is now at the Newark Airport in his capacity of weatherman for the United Airlines. You fellows who travel by air should make it a point to check at the administration building when you pass through an airport; you might find Becky there forecasting the next bad weather. — Shorty Hubbard has returned to Buffalo from Indianapolis, where he spent about a year at the Linde Air Products plant there. He is now back again with the Buffalo laboratory.

Course X. El Kontz, Reliance Electric and Engineering Company, Philadelphia, Pa., is probably busy gathering together another of his newsy letters. We understand he is also working pretty hard — hasn't mentioned a vacation yet and possibly won't get one until Christmastime. El is rooming in an apartment with a fraternity brother of later vintage, Walt Landseidel, in that exclusive residential section of Upper Darby. To tide us over until we hear from El, there are a few news items that have come our way: The wedding of Miss Kate Thursfield and Ben Fogler took place on June 18 at Torrington, Conn. Mrs. Fogler is a graduate of Drew Seminary and Wheaton College with the class of 1937. — May 20 saw the wedding of Miss Sylvia Liebman and Jim Ullman in Brookline. After a wedding trip to England, the young couple are residing in Cleveland. — Andy Brisse has been transferred to the research lab of the Carnegie-Illinois Steel Corporation in Pittsburgh. — Pete Weinert is working for Universal Oil Products Company in Chicago, Ill. — M. W. Kellogg Company has taken another of the Course X boys; this time it's George Webb. He is working in the Jersey City office. — Jim Baker is employed by Baker and Hickman of Madisonville, Ky. — Doc Eberhardt is working for the Bethlehem Steel Company in Bethlehem, Pa.

Course XIII. We have just received the last letter for some time to come from loyal correspondent Art Wells. But let Art tell about it: "Last spring the Maritime Commission foreclosed on the mortgages they held on three of the Munson Line vessels running to South America. When a new organization was formed in June to act as operating agent for the vessels, Harrison Woodman was asked to join the organization to handle personnel. Woodie left the purser's department of the S.S. *Manhattan*, and has been hiring the crews of the *Southern Cross*, the *Pan-America*, and the *Western World* since the South American service was resumed early in June. He also has been active with other operating problems of the vessels. Frank Mather is now located at the Bethlehem 56th Street plant in Brooklyn and has spent some of his time this summer working on alteration plans for the *Pennsylvania* and *Virginia*, which were reconditioned at that yard. Frank spent all his week-ends cruising on the Sound in his newly-acquired 32-foot Crocker-designed yawl, *Sparrowhawk*, a right smart little craft. Leaving for a two weeks' vacation last Monday, he was planning to work in some cruising on the Maine Coast. Frank is talking very seriously these days about doing what every man really wants to do — cruise around the world in a small boat. However, Frank is different; I am pretty certain that he actually will do it. I had hoped to have up-to-date news about the Seaboard Navigation Company and its President, Jack Stapler, and Vice-President, Alden Anderson, but Jack is evidently so busy keeping the M. V. *Penobscot* full and moving that he can't drop a line to a mere stockholder. The significant thing is that the vessel is making her two round trips a week between Boston and Rockland, Bucksport, and Bangor, and is carrying increasing amounts of cargo each month. Perhaps you saw the article about Seaboard Navigation Company which appeared in the Boston *Herald* Sunday magazine section in June. The article was accompanied by a picture of four of the officers, including Stapler and Anderson, and a picture of the *Penobscot* loading at Commercial Wharf, Boston.

"Being in Baltimore for my company last week, I got in touch with Ed Brewster and James Henderson, both of whom are with the Maryland Drydock and Repair Company in design and estimating work. Spending Friday and Saturday evenings with them at the Maryland Yacht Club, I found them in the midst of a real regatta, with all the fixings. They were a couple of busy race committeemen on Saturday, but they planned to play hooky on Sunday to do some racing of their own in Ed's 22 square meter, *Lusty Loon*. Warren Sherburne came up from Newport News to race a slood for a Baltimore friend, and he appeared at the clubhouse in the evening. I'm glad to report that Newport News hasn't got him down and that Sherb is still the life of the party. Dropping in the other day at the Atlantic Mutual Insurance Company's high-ceilinged, marble-decorated office at 49 Wall Street, I had a chat with Charlie Miller. He is handling a good portion of Atlantic's yacht insurance accounts and is enjoying work a lot.

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"As you probably know, Colombian Line ceased operations and went into liquidation in May. Since then, I have joined the Seas Shipping Company (Robin Line) as assistant to the marine superintendent. In order to put in enough sea time to get a third assistant engineer's license, I am going to sail on our *Robin Adair* for one trip. Leaving New York, we go to Capetown, Port Elizabeth, Durban, Beira, Lourenço, Marques, Zanzibar, Mombasa, and then we run over to the southern tip of India. Returning by way of Capetown, we stop at Trinidad on the way to New York. When are we sailing? wow! — It's tomorrow (September 15), and if I don't stop this writing and pack, I'm going to get aboard without a toothbrush or some other essential. I am asking Harrison Woodman to pass on to you any news that he is able to gather, as I shall not be back in New York until the end of January." — Bon voyage to you, Art.

I don't recall that Art has told in a previous issue about the engagement of Miss Ruby White of Larchmont, N.Y., to Alan Hardman. Miss White attended schools in England and Italy and is assistant art director of Penn Hall Junior College, Chambersburg, Pa. Al is with the shipping firm of Moore and McCormack in Jersey City, N.J.

Course XV. The news from this group will be covered in the future by Harry Essley of 13515 Lake Shore Boulevard, Bratenahl, Ohio. You'll recall that Harry is working for Reliance Electric in Cleveland. Harry says he is a bit isolated from the crowd in Cleveland and would be glad to hear from everybody occasionally. He continues: "Way back in the spring, Milner Wallace popped into Cleveland on his way to Indiana, and we had dinner and an evening together. He was taking a week's training course at Nela Park on lighting, which the G.E. Mazda people conduct for utility salesmen. Milner was scheduled to promote utility and industrial lighting for the Indiana utility company. I have just learned that Wallace married a Chicago girl sometime during the summer and is now living in Kentucky. Fletch and Peg Thornton flew to Chicago from St. Louis for the event. Early last May I had a long letter from John Austin, who can best talk for himself. Quote: 'Have just started work on my sailboat, a snipe (one of those slow tubs), to get it ready for the water by June 1. Last Sunday I spilled boiling marine glue on my hand and on the deck instead of in the seam I was about to pay. When the glue had hardened on contact and cooled (meanwhile my flesh sizzling nicely), I pulled it off. I found it was darn good glue, since the skin came off the hand, and it took me an hour and a half to take it off the deck. . . . Scott Rethorst wrote a couple of days ago to say he had been east to Detroit to pick up a new Pontiac — the plutocrat! Don't know whether you knew it or not but I left Wall Street last September. . . . I went to the publicity department of Union Carbide.' To get back to Cleveland, I'm sorry to see the summer go, for the last four months have been filled with sailing. As you probably know, I'm living on the shore of Lake Erie with six other fellows, and last winter we constructed three sailing kayaks with outrigger pontoons, which can beat a snipe or a comet any day. We have a beach of our own, and any Saturday or Sunday finds a crowd gathered for the fun. Roger White '34, who is in the local Linde office as a field engineer, and I took one of the boats on top of his car to Pointe au Baril, Canada, on Georgian Bay, during the last two weeks in July, and spent a perfect vacation sailing, camping, and fishing among the hundreds of rock islands that dot the shore."

Harry included in his letter the news, coming by way of El Koontz, that Nate Ayer was to be married early in October. El said last summer that " . . . he's been passing up beer parties, goes around with a vague look at such times as we can tear him away from York, and is even planning to spend his vacation with her." Pretty soon there won't be any of us bachelors left to uphold the old traditions. But seriously, our best congratulations go to Nate and his wife. — Koontz also reports that "Don Brown (with us freshman year and on the freshman crew) saying that he's graduated from Annapolis and has been assigned to the U.S.S. *Indianapolis* on the West Coast." — Another approaching marriage is that of Harry Tichnor and Miss Grace Atlas (no relation to the strong man) of Brookline. Harry's fiancée went to school at Boston University. — Bill Garth of Firemen's Mutual Insurance Company is now working in Charlotte, N.C. — Ralph VanSant is in the engineering department of the Hoover Company, North Canton, Ohio.

Course XVI. There is no word from Bus Schliemann of Chance-Vought Aircraft in East Hartford, Conn., but I believe I know why. Word has filtered down that Bus was married last June to Miss Ruth Conkling, from the home town of East Orange and a graduate of Wellesley in 1936. Further details are lacking until we hear from Bus himself confirming the good news. Bus had been waiting for this for some time. — Also scheduled to marry a home-town girl is Dave Gildea. His fiancée is Miss Betty Fitzer of Plainfield, N.J. She is a student at New Jersey College for Women. — Henceforth, Charlie Endweiss must be known as lieutenant. He has recently received that designation with the First Marine Brigade at Quantico, Va. — Lieutenant Davisson is at the Naval Air Station at Pensacola, Fla. — Here at Buffalo, the Curtiss Aircraft Company is keeping pretty busy and with them are still a couple of our Class. Jack Hamilton, however, has moved to Clifton, N.J., where he is still with Curtiss-Wright. Johnny Drew has also been transferred, but to St. Louis, where he is in the Curtiss-Wright advertising department. Johnny is working on the promotion of the new Curtiss transport. Henry Runkel was also here in Buffalo during the summer, but he has gone back to St. Louis. So that leaves Fred Flint and Dick Koegler, both of whom I still see every once in a while. They report business is good!

Course XVIII. From Eli A. Grossman, 26 California Road, Mount Vernon, N.Y., comes some news about the fellows of this group: "Congratulations are due to Philip Di Salvatore for his fine mathematical paper which appeared in the September issue of the *Journal of Farm Economics*. After he received his master's degree in mathematics at Princeton, he spent the summer in the actuarial department of the United States Life Insurance Company, working with me. He has several offers for the fall, including an assistantship at Princeton while he writes for his doctor's thesis, and a government job as a statistician. — Albert Schaeffer should be congratulated on his papers which are appearing in the bulletin of the American Mathematical Society. — It was good to hear from Doug Hawks and learn that he is doing nicely in the actuarial department of the Connecticut Mutual Insurance Company in Hartford. . . ." — ANTON E. HITTL, *General Secretary*, 491 Ashland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3–210, M.I.T., Cambridge, Mass.

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From *VI-A News* comes the only bit, outside of engagements and marriages, to pass my desk since last spring: Bob Childs, who is at the Columbia University Medical Center, is evidently enjoying his work immensely. He writes: "So far I've performed a surprising variety of tasks, from drawing locomotion charts of walking children and making recordings of crying babies to correlating large groups of data and developing an approximate solution to an unsolvable equation. The motion picture is an important tool in this clinic, so that I've had a chance to see many reels of pictures covering all phases of a child's development. . . ."

The engagements as they have been picked up in the papers are: Miss Marjorie Niles of Melrose, Mass., to Louis B. Heaton, Jr.; Miss Constance Curtis of Belmont, Mass., to John C. Robbins, Jr.; Miss Margi Ann Watson, Highland Park, Ill., to James M. Ewell; Miss Joan Drew of Newton Highlands, Mass., to Robert H. Ritchings; Miss Margery Allen of Concord, Mass., to Alden E. Acker; Miss Lois Jane McCarthy of Somerville, Mass., to Henry Guerke. The weddings: Miss Jeanette Wallace of Newton Center, Mass., and Richard Westfall; Miss Mary Childers Bowditch of Framingham, Mass., and Kenneth W. Winsor. (I wish classmates would send me engagement announcements and wedding invitations so we could be but one month behind, instead of sometimes three and four.)

A bit of very saddening news just came in concerning an airplane crash at Selfridge Field, Michigan. James Breathitt, 3d, was killed in the crash. — WINTHROP A. JOHNS, *General Secretary*, 18 West Union Avenue, Bound Brook, N.J.

THE VOICE WITH A *Smile*

NORTH

SOUTH

It may carry the salty twang of New England or the soft accents of the South.

It may be swift and clipped in the New York manner or full of the rolling r's in the style of the West.

But wherever you hear it, it will be friendly, courteous, and efficient.

It's the all-American voice of the Bell Telephone operator—"The Voice with a Smile."

The entire Bell System seeks to serve you quickly, capably and in the spirit of a friend.

EAST

WEST

BELL TELEPHONE SYSTEM

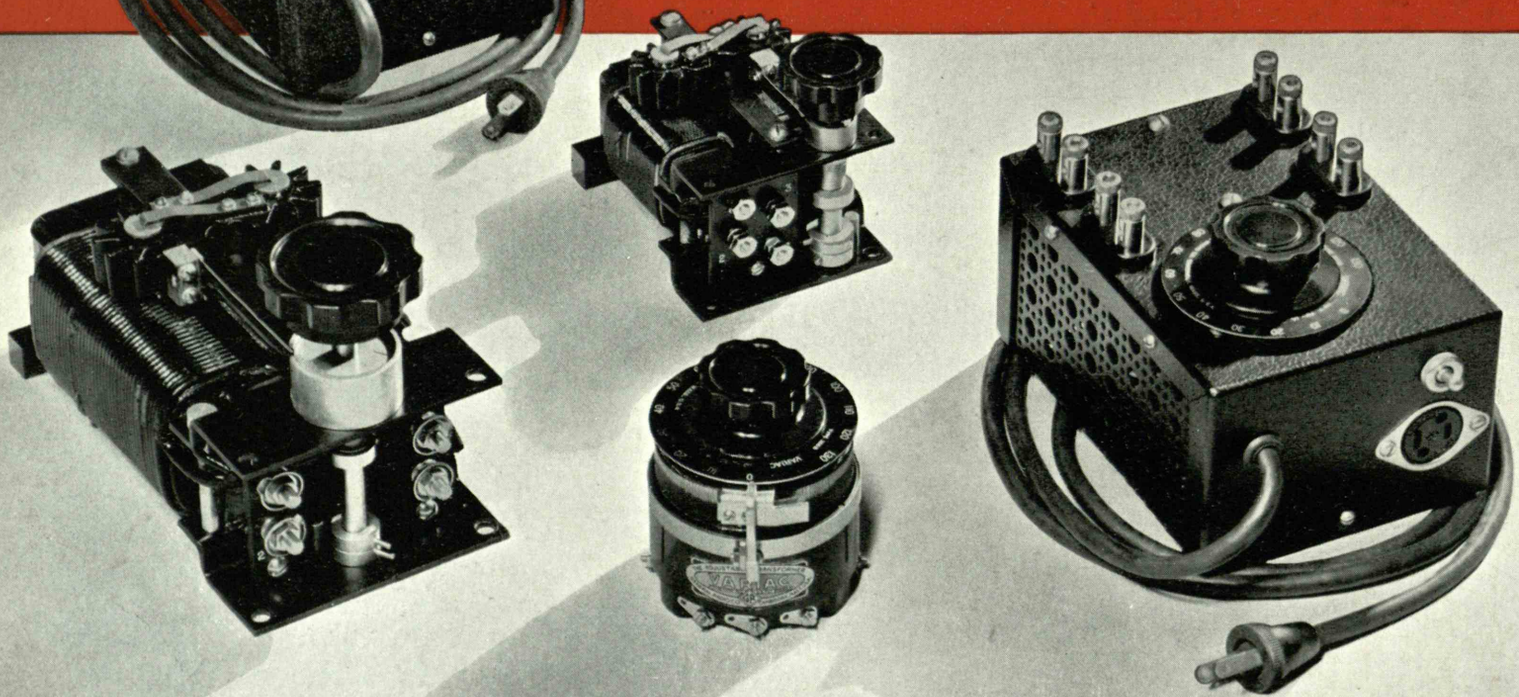
VARIACS

for A-C VOLTAGE CONTROL

★ SMOOTHNESS OF A RHEOSTAT
★ EFFICIENCY OF A TRANSFORMER
★ OUTPUT VOLTAGES ABOVE LINE

18 MODELS.....860 WATTS TO 2 KW

WRITE FOR *NEW* BULLETIN 311



GENERAL RADIO COMPANY CAMBRIDGE MASSACHUSETTS